VOL. 35 NO. 2 | FALL 2016

BUILDINGENERGY

The Magazine of the Northeast Sustainable Energy Association

NEW YORK CITY IS TRANSFORMING BUILDINGS FOR A LOW CARBON FUTURE

ALSO INSIDE:

RESILIENCY FOR AFFORDABLE MULTIFAMILY HOUSING: WHAT WE HAVE LEARNED AND WHAT WE STILL NEED TO KNOW

SOLAR POLICY IN THE NORTHEAST: WHAT'S NEW, WHAT'S NEXT?

BUILDINGENERGY GREEN PAGES

We've got you covered.

baja CONSTRUCTION CO. INC.™

Have Your Project Pay for Itself with Solar Integration

Customize your project with high-tensile, light-gauge *Solar Support Structures* to generate both power and revenue.

Advance through project development with our in-house team of engineers & craftsmen for a One-Stop Solution.

- ✓ DESIGN
- ✓ ENGINEER
- ✓ SUPPLY
- ✓ INSTALL

800-366-9600
www.BajaCarports.com
info@BajaCarports.com
223 Foster St., Martinez, CA 94553

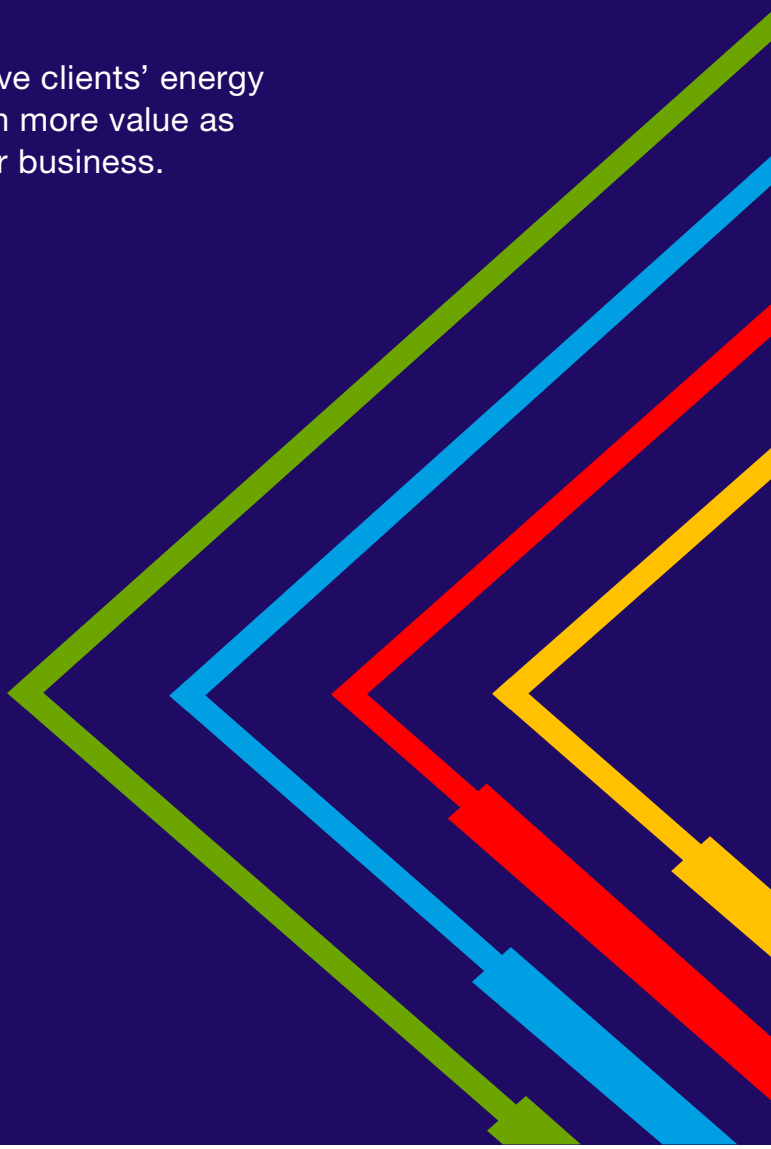
nationalgrid

HERE WITH YOU. HERE FOR YOU.

Lead your clients with better energy saving know-how.

We're ready to help you find new ways to solve clients' energy challenges. You'll cut clients' costs, add even more value as a partner, and have new tools to expand your business.

Call **844-280-4327** or visit **ngrid.com/trade** to take advantage of our solutions for professionals like you.



FOR ELIGIBLE PROJECTS within National Grid's electric and/or gas service territories in Massachusetts, New York and Rhode Island. National Grid does not guarantee savings. Savings and energy efficiency experiences may vary. Terms and conditions apply.

In Rhode Island: These programs are funded by the energy efficiency charge on all customers' utility bills, in accordance with Rhode Island law.

PASSIVE HOUSE CERTIFIED

Glass up to R-14

Lexington, MA Residence
Design: ZeroEnergy Design, P.C.
Product: Schuco AWS 75 with R-10 glass

Celebrating Our 10th Year as New England's Leading Supplier

of Residential and Commercial Advanced Fenestration Systems

Window Supplier Team Massachusetts Solar Decathlon

SCHÜCO

EUROPEAN ARCHITECTURAL SUPPLY

MAKROWIN

144 North Road Suite 2500
Sudbury, MA 01776
1.781.647.4432

www.FineWindows.com

SUPERVISED DELIVERY | TRAINING | INSTALLATION | SERVICE

BUILDINGENERGY

BUILDINGENERGY
is published for:
THE NORTHEAST SUSTAINABLE ENERGY ASSOCIATION
50 MILES STREET,
GREENFIELD, MA 01301
413-774-6051 (PH)
NESEA.ORG
PUBLISHER AND EDITOR-IN-CHIEF
JENNIFER MARRAPESE
DESIGN ASSISTANT
JENNY GOLDBERG

Magazine printed on 10 percent PCRF, triple certified FSC, SFI and green-e paper with 70# text weight made and 70# cover.

PUBLISHED BY
NAYLOR
ASSOCIATION SOLUTIONS
5950 NW FIRST PLACE
GAINSEVILLE, FL 32607
P: 352-332-1252 OR
800-369-6220
F: 352-331-3525
www.naylor.com
GROUP PUBLISHER:
MARCUS WESTON
CONTENT STRATEGIST:
RACHAEL RYALS
PROJECT MANAGER:
MIKE ROSS

NESEA STAFF
DIRECTOR OF PROGRAM DEVELOPMENT
MIRIAM AYLWARD
DEVELOPMENT COORDINATOR
ZACH BITZER
CONFERENCE COORDINATOR
SUSAN FARBER
DIRECTOR OF OPERATIONS
BETH FRASER
MARKETING MANAGER
JENNY GOLDBERG
MANAGER OF IT & DATABASE
ELI LISSECK
PROGRAM & MEMBERSHIP COORDINATOR
FLORENCE MACGREGOR
EXECUTIVE DIRECTOR
JENNIFER MARRAPESE
MEMBERSHIP MANAGER
KATIE SCHENDEL
BUSINESS MANAGER
GINA SIEBER

MARKETING MANAGER:
KAYDEE CURRIE
ADVERTISING DIRECTOR:
MARJORIE PEDRICK
ADVERTISING SALES SPECIALISTS:
NATHAN BURGMAN
ANTHONY LAND
SCOTT MCKENZIE
TOBIAS VALDEZ
MATTHEW YATES
CHRIS ZABEL
DESIGNER:
GORDON KLASSEN

PUBLISHED SEPTEMBER 2016
ENE-B0216/3602

COVER PHOTO CREDIT: TRENTBELLPHOTOGRAPHY.

ABOUT NESEA AND BUILDINGENERGY MAGAZINE

The Northeast Sustainable Energy Association (NESEA) is the region's leading organization of professionals working in sustainable energy, whole systems thinking and clean technology. We advance the adoption of sustainable energy practices in the built environment through this magazine (distributed to NESEA members), our annual BuildingEnergy conferences and trade shows, BuildingEnergy Pro Tours, BuildingEnergy Bottom Lines and more. A NESEA membership is $55/year, which includes *BuildingEnergy* magazine.

NESEA™
NORTHEAST SUSTAINABLE ENERGY ASSOCIATION

TABLE OF CONTENTS

STRATEGIC PLANNING 2016:
THE NESEA BOARD AND MEMBERSHIP GUIDE THE "WHAT;" THE STAFF DETERMINES THE "HOW"

BY JENNIFER MARRAPESE

PHOTO CREDIT: MATTHEW CAVANAUGH

BY MICHAEL BRUSS

PHOTO CREDIT: MATTHEW CAVANAUGH

We are engaging in a *planning process*, rather than developing a *plan*.

Typically, *BuildingEnergy* magazine would feature both a letter from the executive director and the board chair. This time, we have decided to address the NESEA community together in the spirit of our latest endeavor.

NESEA has embarked on a strategic planning process that is engaging the "three legs of the stool" that form our community – the board, staff and members (or those who would-be/should-be/used-to-be members) by interviewing them about NESEA's strengths and weaknesses and asking them how we could serve them better. In this process, and under NESEA's governance model, the board (and by extension, the members) are responsible for the *"what"* – for identifying the strategic priorities of the organization. From there, the executive director and staff are responsible for the *"how"* – the operational plan to accomplish these priorities.

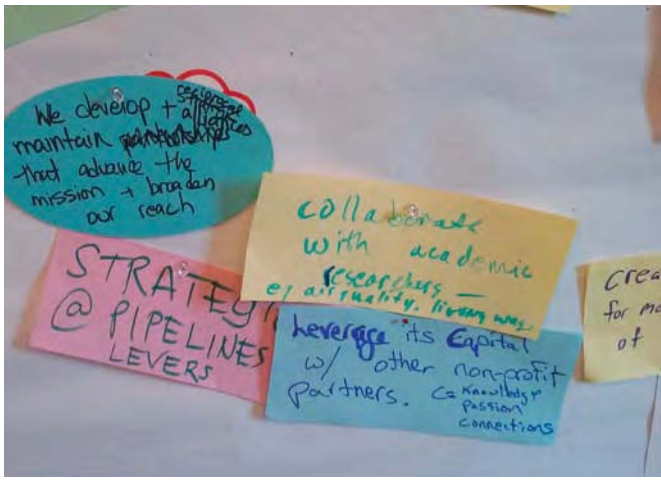
This comprehensive approach to strategic planning is unprecedented here at NESEA: Never before have we involved such a diverse group in charting our course over the long term.

This year's planning process kicked off in May during the board's annual retreat. Organizational development consultant Jeanette Millard led the board through a visioning exercise that invited each person to share with the group what passion of theirs is tapped by being on the NESEA board. A few themes surfaced from this conversation:

- Connecting people with a common goal; to share and learn from one another.
- NESEA offers a unique combination of the technical and the aspirational.
- A love for introducing fresh faces into a vibrant community.
- NESEA and its members are working toward a generative, rather than extractive, economy.

Next, we created a shared mind map of what we would most like to see NESEA be and/or do over the next three-to-five years, and completed an environmental scan to identify some of the external conditions, threats and opportunities that are present or emerging in the Northeast.

We recognized the need to reach out to NESEA community members to gather a broader range of feedback and to ensure that we weren't operating in an echo chamber. So we identified a list of stakeholder groups – collaborators, architects and engineers, builders, facilities/sustainability managers, developers, energy consultants, utilities, sponsors and governmental agencies – to engage in our process. NESEA board and staff members interviewed



ASPIRATIONS ON A MESSAGE BOARD EXERCISE.
PHOTO BY JEANETTE MILLARD.

representatives from each group to learn more about our strengths and weaknesses – and about where and how we might add more value for our members.

The board itself has benefited immensely from conducting the interviews. In the words of Development Committee Chair Phil Kaplan, "It has really been energizing to hear this valuable information directly from people…After all, we are all about relationships and connections. And that's exactly what we're strengthening by making these calls. **The conversation itself is the relationship.** I'm convinced that every conversation between members makes us stronger."

Board Treasurer Paul Eldrenkamp commented, "I've been talking with representatives of state agencies. It's been great to hear what an essential resource NESEA has become for them. They want to hear a lot more from NESEA and its members – they need us. We're the organization that gives them hope by demonstrating what's possible if you have the right spirit and attitude. Our responsibility as an organization and as a board might be even bigger than we realized. It's sobering, gratifying and inspiring all at once."

Here are some of the common themes and headlines that are emerging from our stakeholder interviews:

- The RFP process for the conferences could be clearer.
- There's a perception that the planning committees for the conferences are cliquey.
- The network is stellar, but the community is a bit introverted – stop preaching to the choir.
- We need to define our target audience better. It's not possible to be all things to all people. Choose to go broader or deeper, not both.

CONTINUED ON PAGE 8

Welcome to the new solar hot water

Accelera® Heat Pump Water Heater is a cost-effective and green alternative to solar thermal hot water.

- Added to solar electric, only 3.8 kWh per day offsets annual hot water energy costs
- Saves 80% compared to a standard electric tank
- Low carbon footprint
- 3" foam insulation for extremely low standby losses
- Quiet 52 dB sound pressure level
- Superior design from decades of experience

Accelera® 220 E
58-gallon
heat pump water heater

Accelera® 300 E
80-gallon
heat pump water heater

German Engineering

Engineering & manufacturing excellence since 1924

800.582.8423
www.stiebel-eltron-usa.com

STIEBEL ELTRON
Simply the Best

THEMES FROM NESEA'S 2016 ANNUAL BOARD RETREAT

Organizational Development Consultant Jeanette Millard led the board through a visioning exercise that invited each person to share with the group what passion of theirs is tapped by being on the NESEA board. Responses to this this exercise included:

- Connecting people with a common goal; to share and learn from one another.
- NESEA offers a unique combination of the technical and the aspirational
- A love for introducing fresh faces into a vibrant community.
- NESEA and its members are working toward a generative, rather than extractive, economy.

CONTINUED FROM PAGE 6

- NESEA's focus on data makes it stand out.
- People want more opportunities to gather locally at NESEA events.
- "NESEA members laugh at themselves, talk about what didn't work as well as what did – what went on behind the curtain."
- NESEA should offer more hands-on learning opportunities.
- NESEA is still associated with the BuildingEnergy Boston Conference. The two are still interchangeable in the eyes of many.
- NESEA should keep expanding the ways it reaches out to emerging professionals and students.
- NESEA should feature more cutting-edge, vetted products, particularly in the trade shows.
- Why doesn't NESEA weigh in on policy issues or educate the community on that front?
- Regional focus is a plus. Do more in NYC.
- NESEA could do more to reach out to new speakers. Don't feature the same-old every year.
- NESEA can/should fulfill three roles: education, advocacy and convenor.

Some of this feedback confirms what the board and staff suspected; some of it points to new ways we can serve the community.

What's next? Based on the data we've gathered from the stakeholder interviews and from our own research of the market, the board and staff will work together to establish a set of strategic priorities for the next three-to-five years. We'll organize them into action items we can address immediately, and things that will take a longer time to gear up for and accomplish. This work will take place into the early fall, and will culminate with the board adopting a strategic plan in November.

From there, Executive Director Jennifer Marrapese will work with the NESEA staff to develop an operating plan – the "*how*."

One of the big caveats we'll need to keep in mind is this: We are engaging in a *planning process*, rather than developing a *plan*. This distinction is important; we've embarked on a journey toward a stronger, more vibrant organization that serves its community better than ever. We're mapping the course, but there are sure to be detours along the way.

We are eager to keep you updated as the process unfolds, and to involve you in whatever initiatives result. Many thanks to those of you who have provided, and continue to provide, feedback along the way!

ABOUT THE AUTHORS

Jennifer Marrapese *takes care of the big picture: How do we make NESEA's multidisciplinary network of practitioners bigger and better? She works with the board of directors and the membership to establish NESEA's strategy and to ensure that the board and staff have the resources to execute it. Jennifer is known for her strategic sense and for her ability to forge strong partnerships among staff teams, NESEA members and other collaborators. She earned her BA in Journalism from the University of Wisconsin, Madison, her JD from the University of California, Berkeley, and her MA in Organizational Management and Development from Fielding University. She lives in South Deerfield, Massachusetts, where she and her family completed a deep energy retrofit of their 1977 ranch house, and are living as close to net zero as possible with two teenage girls and a swimming pool!* LIFETIME MEMBER

Michael Bruss *is the president of Bruss Project Management and currently serves as NESEA's board chair. Prior to founding Bruss Project Management, he served as president of Bruss Construction and Integrated Building Energy Associates, LLC. Michael's passion and drive focuses on building with green technologies, reuse of historic structures, energy efficiency and preparing today's buildings for future generations. With more than 30 years of experience in project development and management with a diverse group of building projects, Michael brings unmatched collaboration, innovation and craftsmanship to every project that he is involved in.* BUSINESS MEMBER

An innovative commissioning firm working on the leading edge of sustainable building practices

Stephen Turner Inc.

Building Better Performance

At 5 years old, we've worked on some of the most exciting high performance building projects in the world:

- International FIFA stadium
- The largest neurocognitive research facility world-wide
- LEED® Platinum, Gold, and Northeast CHPS rated facilities
- Net Zero schools & facilities

Dedicated to providing comprehensive commissioning services including:

NEW BUILDING COMMISSIONING

EXISTING BUILDING COMMISSIONING

FACILITY ASSESSMENT

ENHANCED OPERATIONS & MAINTENANCE

ENERGY AUDITING

HIGH PERFORMANCE BUILDING TRAINING

317 Hope Street, Providence, RI 02906, United States | +1.401.273.1935
info@sturnerinc.com | www.greenbuildingcommissioning.com

NEW YORK CITY IS TRANSFORMING BUILDINGS FOR A LOW CARBON FUTURE

HOW THE MAYOR'S OFFICE OF SUSTAINABILITY'S BUILDING TECHNICAL WORKING GROUP TURNED BUILDING DATA INTO 80 X 50 INTERVENTIONS

BY LIZ HANSON AND JOHN LEE

BACKGROUND PHOTO CREDIT: JOHN LEE

In 2014, Mayor Bill de Blasio committed to reduce New York City's greenhouse gas (GHG) emissions by 80 percent by 2050 (80x50), becoming the largest city in the world at the time to commit to the United Nations' target for developed nations to keep global temperature rise below two degrees Celsius. According to the city's annual *Inventory of New York City Greenhouse Gas Emissions*,[1] this means cutting 44.6 million metric tons of carbon dioxide equivalent (MtCO2e) from 2005 levels.

Over the next year, the city conducted the most comprehensive analysis ever completed on New York City's building data, with input from more than 50 members of New York City's world-class design, engineering, affordable housing, labor and real estate communities. In April 2016, Mayor de Blasio announced a suite of new initiatives to transition the city's one million buildings to a low carbon future.[2]

To lead by example, beginning in 2017, all new capital projects for city-owned properties will meet an energy performance target of 50 percent below today's median energy use.

THE CHALLENGE

New York City has been inventorying GHG emissions annually since 2007, and has been collecting data on building energy performance under Local Laws 84 (LL84) and 87 (LL87) since 2009. These laws require owners and managers of buildings over 50,000 square feet in floor area to benchmark their energy and water consumption annually and conduct an energy audit and retro-commissioning every 10 years. As a result, the city has one of the most robust datasets of any large city on its buildings, how they perform and their emissions at the system level. The annual GHG inventory consistently shows that the energy used in buildings contributes nearly three-quarters of citywide GHG emissions. While New York City's per capita GHGs are only one-third of the United State average, in order for the city to meet 80x50, building energy use will have to drop significantly.

In early 2015, Mayor de Blasio convened a Buildings Technical Working Group (TWG) of more than 50 experts and kicked off the study of New York City's building energy use, utilizing the data from LL84 and LL87, as well as the city's Green Buildings Law and other data sources.

TWG members helped determine the leading edge standards for new construction and substantial renovations, as well as systems-specific opportunities for existing buildings to transform the city's building stock. The group also considered the financial and regulatory structures that serve as opportunities and barriers to scaling up energy efficiency and the operations, maintenance and training needed to transform the industry.

Twenty-one building typologies, grouped by age, size and end use, emerged from the data sets, allowing the city to analyze trends and energy use at a building system level across similar building types for the first time. New York City's building stock is diverse, but distinct trends emerged that help identify replicable efficiency opportunities. For buildings in the data set, heating accounts for the largest share of energy use, followed by domestic hot water (DHW) production, electric plug loads, lighting and space cooling.

Overall, heating accounts for more than a third of energy use in large buildings and more than 40 percent of GHG emissions. For large multifamily buildings, heating and DHW production, which typically require burning fossil fuels, account for more than half of the energy use and nearly three-quarters of GHG emissions. In large commercial buildings, energy use and GHG emissions are more evenly distributed.

Based on the city's LL87 building system inventory data, the city determined that more than 70 percent of large buildings use steam heating

distribution. Many of these systems are decades old and not well-maintained. Under these circumstances, in addition to wasting energy, these systems can cause widely varying temperatures within a building, with uncomfortably cold or hot rooms.

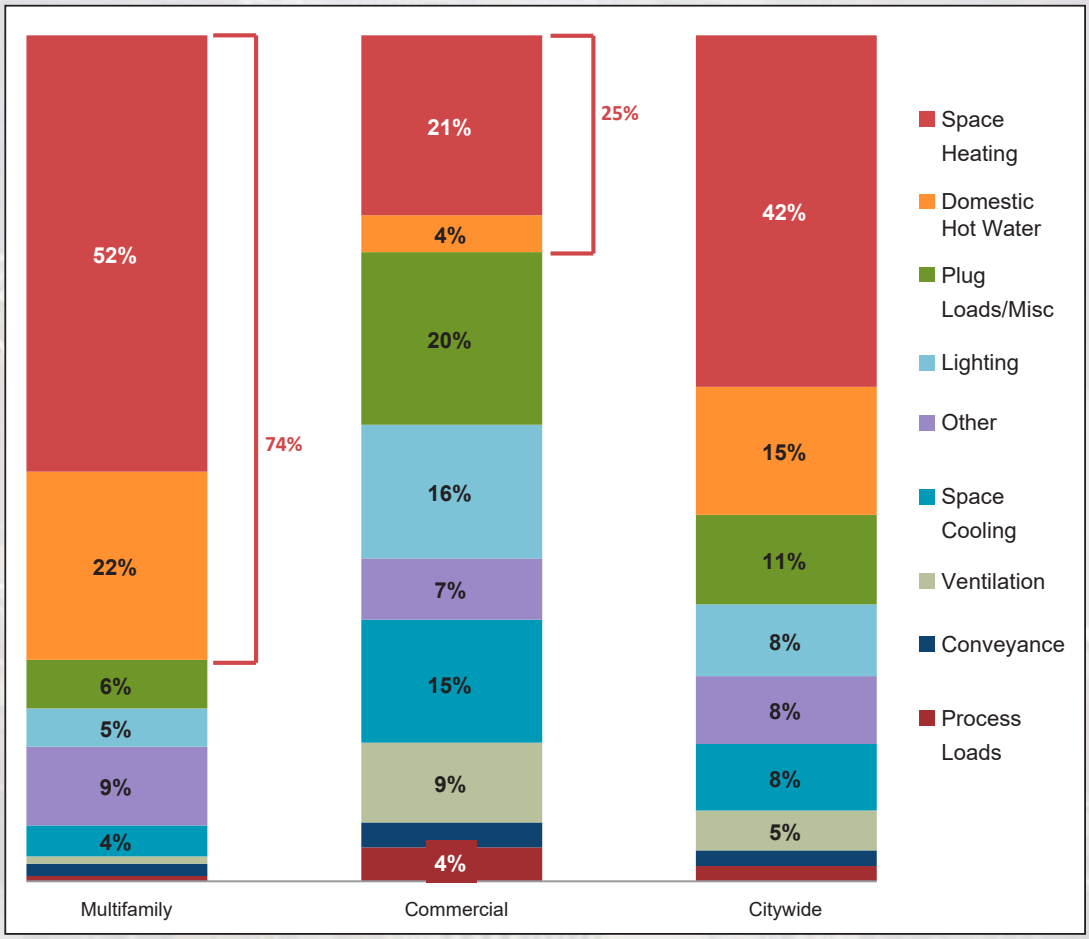
The dataset also indicated that more than 90 percent of cooling systems are non-central systems. This poses additional challenges because window and through-wall unit openings allow heat to leak in the winter, exacerbating waste and discomfort.

The city's existing policies and programs created a solid foundation for reducing energy use, but they were not enough to reach 80x50. Therefore, the TWG identified the systems-specific opportunities in existing buildings that, if implemented, would place buildings on a pathway to achieving 80x50. TWG members helped develop and analyze nearly 100 low-to-medium difficulty energy conservation measures (ECMs) across all system types. If every applicable building immediately implemented every one of these cost-effective ECMs, building-based GHG emissions would be reduced by 33 percent, yielding a 21 percent citywide reduction in GHG emissions from a 2005 baseline.

The TWG also analyzed deep retrofit strategies for eight building typologies, covering roughly 60 percent of New York City's built square footage. The city created energy models of each of these typical buildings based on the most common construction methods and building systems within each typology, which were then calibrated to real buildings based on LL87. The results of this analyses show that existing technologies and strategies could potentially reduce energy use and GHG emissions by 40-to-60 percent in typical New York City buildings, with greater possible reductions given a significantly cleaner electric grid.

By 2050, the city anticipates that the growth in built square footage from new construction will increase GHG emissions from the building sector by 8.9 percent, or 3.2 $MtCO_2e$, under today's standards. To determine how future iterations of the city's energy code might impact this new development, the city projected future GHG reductions based on historic ASHRAE 90.1 updates, using U.S. Department of Energy studies completed by the Pacific Northwest National Laboratories (PNNL).[3] The city correlated PNNL's energy use profiles of six prototype buildings in New York State, with permit data from the NYC Department of Buildings. Based on this analysis, the projected increase in GHG emissions from new

GHG EMISSIONS DISTRIBUTION. *SOURCE: ONE CITY BUILT TO LAST TECHNICAL WORKING GROUP REPORT: TRANSFORMING NEW YORK CITY BUILDINGS FOR A LOW-CARBON FUTURE.*



construction would be 2.2 $MtCO_2e$. This reduces emissions by roughly 1 $MtCO_2e$ from business as usual, but falls short of the reductions ultimately needed. Moreover, there is some doubt that these levels of efficiencies could be achieved, as achieving efficiencies from individual pieces of equipment is reaching a point of diminishing returns.

WHERE WE GO FROM HERE

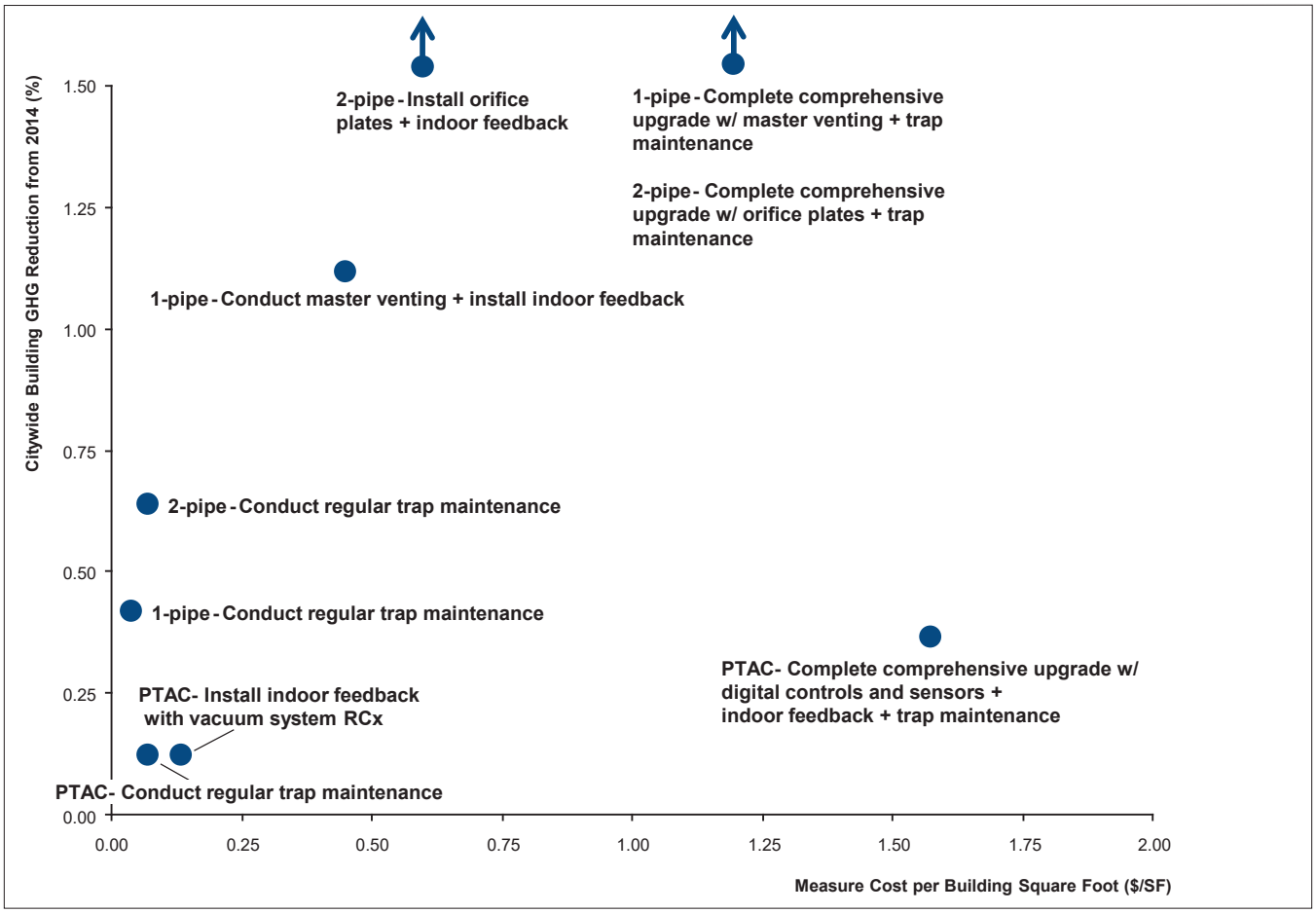
The city is already in the process of adopting the best practices and cost-effective ECMs identified by the TWG. In addition to reducing GHG emissions, based on city multipliers, these ECMs have the potential to yield $2.7 billion in energy savings and create approximately 15,000 direct construction-related jobs.

The city will also require improved maintenance of heating distribution systems, including specific requirements for steam systems, in all large and mid-sized buildings. This improvement has the potential to reduce GHG emissions by 1.4 $MtCO_2e$, or four percent from current building-based emissions – which represents one of the most significant potential impacts of the ECMs analyzed.

The city is leading by example, and has committed to retrofitting all public buildings with significant energy use by 2025. Finally, the city is developing a simple template for individual buildings that will identify deep retrofit options and will require owners of large and mid-sized buildings to report the results in their energy audits. This will allow owners and decision-makers to factor the results into capital planning cycles. The NYC Retrofit Accelerator is already incorporating these measures into the support they offer building owners and decision makers.

Improvements to the design and construction of new buildings must also be part of 80x50. To lead by example, beginning in 2017, all new capital projects for city-owned properties will meet an energy performance target of 50 percent below today's median energy use. The city will require all new privately-owned buildings to report on an

CONTINUED ON PAGE 15



EXAMPLE OF GHG AND COST IMPACT ANALYSIS: STEAM HEATING DISTRIBUTION SYSTEM EFFICIENCY MEASURES.
SOURCE: ONE CITY BUILT TO LAST TECHNICAL WORKING GROUP REPORT: TRANSFORMING NEW YORK CITY BUILDINGS FOR A LOW-CARBON FUTURE.

YARDI® Smart Energy Suite

YARDI

Maximize Energy Efficiency

Reduce energy consumption while keeping tenants comfortable. Achieve paperless invoice processing with full visibility into utility costs, consumption and recovery. Automate tenant submetering and utility billing. Leverage easy ENERGY STAR® submissions.

To learn more, call **800.866.1144**
Or visit **www.yardi.com/energy**

BUILDINGENERGY NYC

NOVEMBER 3, 2016 • TKP CONFERENCE CENTER • NESEA.ORG/BENYC

Conference + Trade Show of the Northeast Sustainable Energy Association (NESEA)

LEARN

Choose from 24 fully-accredited sessions on energy efficiency, building science, energy policy and infrastructure, and more.

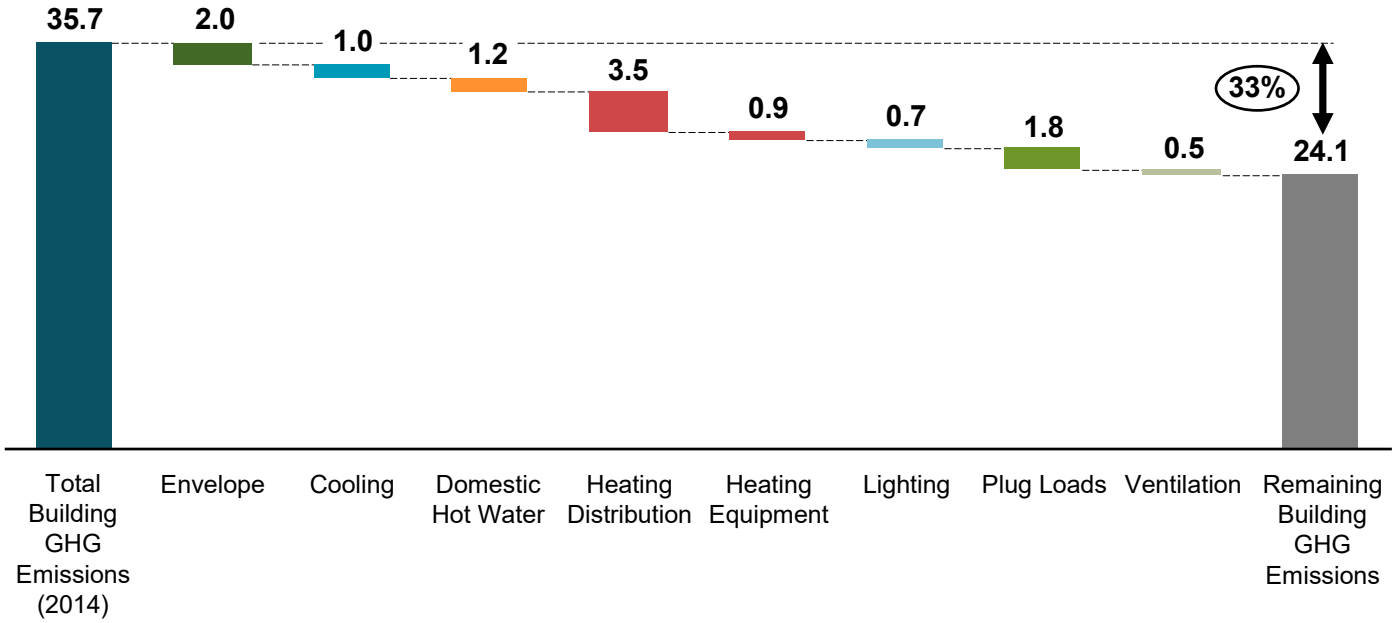
NETWORK

Engage with over 500 established and emerging professionals to discuss sustainability in the built environment.

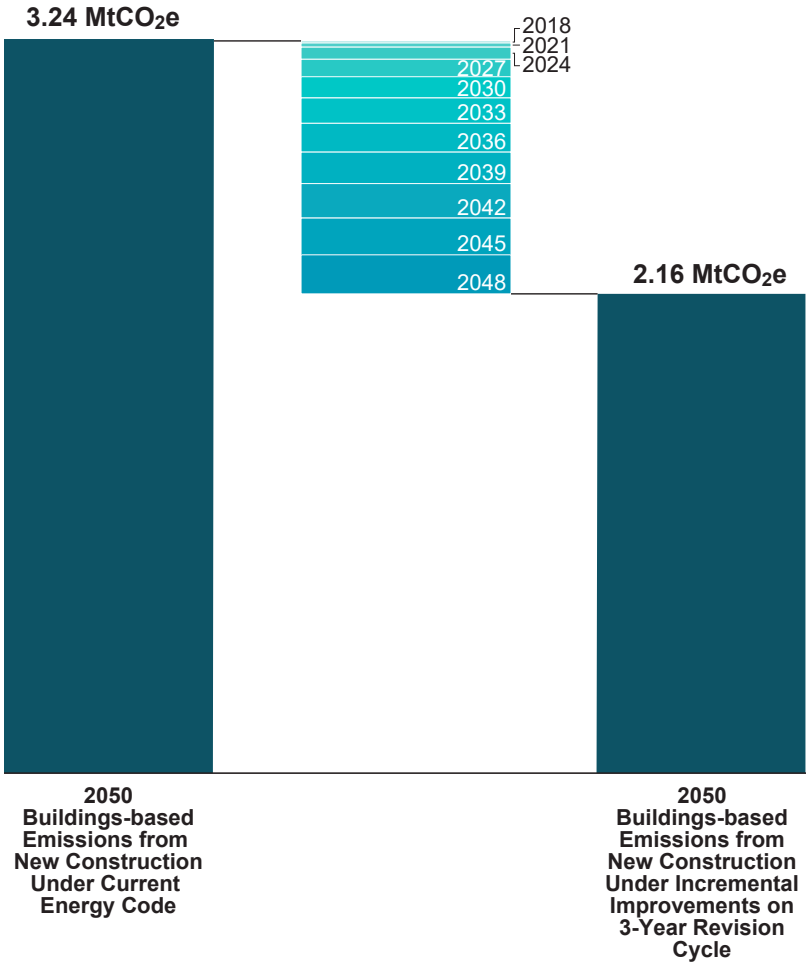
IMPROVE

Visit the trade show floor to hear directly from product experts, develop professional partnerships, and discover industry best-practices.

Register today at: NESEA.ORG/BENYC



TECHNICAL POTENTIAL FOR GHG REDUCTIONS FROM ECMS BY BUILDING SYSTEM (MTCO2E). *SOURCE: ONE CITY BUILT TO LAST TECHNICAL WORKING GROUP REPORT: TRANSFORMING NEW YORK CITY BUILDINGS FOR A LOW-CARBON FUTURE.*



PROJECTED INCREMENTAL COSTS OF NEW ENERGY CODE WITH SCENARIO OF REPLICATING HISTORICAL CODE ADVANCEMENTS. *SOURCE: ONE CITY BUILT TO LAST TECHNICAL WORKING GROUP REPORT: TRANSFORMING NEW YORK CITY BUILDINGS FOR A LOW-CARBON FUTURE.*

CONTINUED FROM PAGE 12

energy performance metric by 2019 and meet an energy performance design target by 2022. This new paradigm will require a holistic approach to building design that will yield substantially better energy use performance.

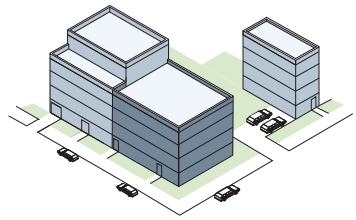
The city is working with stakeholders to create a new metric to assess whole building energy performance that takes into account differences in occupancy and space use and to develop proof of concept across the city's building typologies. To achieve the full potential of GHG reductions, the city will also work to remove barriers to investing in energy efficiency and expand opportunities to encourage these investments. All buildings, including small, mid-sized, and historic buildings, will need to contribute to the city's commitment.

Both professionals and trades will need to be trained in new methods and technologies. Increased coordination between landlords and tenants on energy efficiency must become standard practice, and the City is using the Carbon Challenge program to convene leaders to develop replicable solutions to the barriers that can prevent these types of partnerships. Investments in energy efficiency should ultimately yield operational cost savings that will lower housing costs for New Yorkers, but access to financing options will need to be expanded.

Achieving 80x50 in New York City is no small task. Significant changes in the way buildings are constructed and operated will be required. New York City's combination of data, deep analysis and expert stakeholder participation has produced a comprehensive approach to building energy strategies. Pairing these strategies with the extensive support programs available to New York City building owners, including the NYC Retrofit

MULTI-FAMILY, PRE-WAR
UP TO 7 STORIES

This typology includes the most square footage in New York City after one- to four-family homes. These buildings typically include one-pipe steam distribution systems with limited or no controls to provide space heating. Window air conditioners provide summertime cooling and create window or wall penetrations and lead to air leakage year-round and a high air infiltration rate.



Size	12,600 SF average
Height	4 Stories + 1 Below-grade

Baseline Conditions

Wall Construction: Mass wall (R-5)
Roof: Insulation above deck (R-12)
Lighting: 0.40Watts/SF
Plug Loads: 0.55 Watts/SF
Heating System: Dual fuel boiler, 1-Pipe Steam
Cooling System: Window A/C
DHW System: Indirect coil in steam boiler

Efficiency Measures Applied to All Paths

Lighting: Reduce LPD
Plug loads: Master switching; Smart plugs; Replace appliances
DHW: Install low flow fixtures; Condensing gas boiler
BMS/EMS: Controls to provide indoor feedback and implement set-backs
Ventilation: Unitized through-wall exhaust ventilation

Path 1
Efficient Systems

- Optimized best in class natural gas steam boiler and steam distribution
- ENERGY STAR A/C
- Solar PV on 25% of the roof

Path 2
Hydronic Conversion

- Remove Window A/C
- Water source heat pump with gas boiler and air cooled condenser for heating and cooling
- Solar PV on 25% of the roof

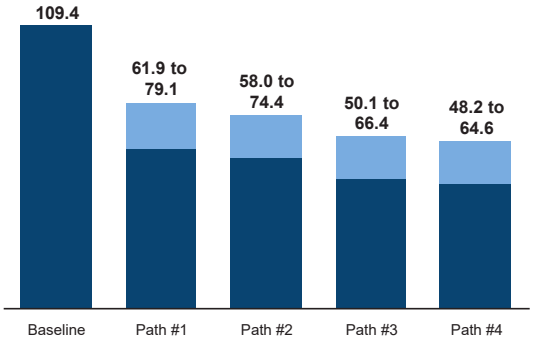
Path 3
Electrification

- Remove window A/C
- Air source heat pump with minisplits for heating and cooling
- Solar thermal for 50% of the DHW load

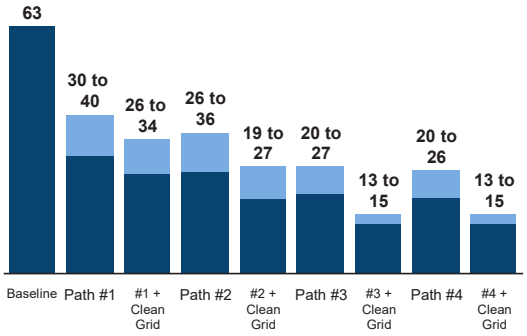
Path 4
Electrification + Re-cladding

- Re-clad 100% of facade
- Remove window A/C
- Air source heat pump with minisplits for heating and cooling
- Solar thermal for 50% of the DHW load

Path Source EUI Reduction (kBtu/SF)



Path GHG Emissions Reduction ($MtCO_2e$)



EXAMPLE RETROFIT PATH ANALYSIS: MULTIFAMILY, PRE-WAR, UP TO 7 STORIES. SOURCE: ONE CITY BUILT TO LAST TECHNICAL WORKING GROUP REPORT: TRANSFORMING NEW YORK CITY BUILDINGS FOR A LOW-CARBON FUTURE.

Accelerator's High Performance Retrofit Track, will set the city on the road towards deep carbon reductions.

ABOUT THE AUTHORS

John Lee *is the Deputy Director for Green Buildings and Energy Efficiency at the NYC Mayor's Office of Sustainability. He is leading the city's policy and legislative efforts driving the built environment to reach its greenhouse gas reduction targets through programs and policies including the Energy and Water Use Benchmarking ordinance and requirement for energy audits in NYC's largest buildings. John formerly held a seat on the New York State Uniform Code Council as the Mayor's representative, and has led numerous studies, stakeholder engagement, and publications related to buildings and climate change mitigation. He is a licensed architect and a graduate of Rice University and Harvard University. Don't miss his session, "Empowering NYC to Fight Climate Change and Thrive," at the BuildingEnergy NYC Conference + Trade Show, Nov. 3, 2016, at the TKP Center in Manhattan.* MEMBER

CONTINUED ON PAGE 18

SMARTER. From the ground up.

Bensonwood designs and builds durable, high-performance buildings throughout North America. Our master craftsmanship and off-site fabrication ensure that every distinct Bensonwood structure delivers lasting value and an enduring legacy. Rethink how buildings can be built.

Learn more @ bensonwood.com or call us @ (603) 756-3600.

BENSONWOOD

Beautiful. Sustainable. Smart.

CONTINUED FROM PAGE 16

Liz Hanson *managed the Buildings Technical Working Group and Technical Study as a Senior Policy Advisor in the NYC Mayor's Office of Sustainability. She led a group of more than 50 private sector stakeholders in analyzing New York City's building benchmarking, audit, and retrocommissioning data and helping to determine the policies and programs necessary to transform New York City's buildings for a low-carbon future. Liz formerly served in numerous roles in Massachusetts state government, focused on climate mitigation and resiliency, as well as housing and economic development. Liz is a graduate of Temple University, and is currently pursuing her Masters in Public Policy at the Harvard Kennedy School of Government.*

REFERENCES

1 City of New York (2016). *Inventory of New York City's Greenhouse Gas Emissions*, retrieved from: http://www.nyc.gov/html/dem/downloads/pdf/NYC_GHG_Inventory_2014_Released_2016.pdf

2 City of New York (2016). *One City Built to Last Technical Working Group Report: Transforming New York City Buildings for a Low-Carbon Future*, retrieved from: www.nyc.gov/TWG.

3 Hart, R., Althalye, R., Xie, Y. et al. Pacific Northwest National Laboratory (2015). Cost-Effectiveness of ASHRAE Standard 90.1-2013 for the State of New York, retrieved from: PNNL-24223 Rev-1 Cost-Effectiveness of ASHRAE Standard 90.1- 2013 for the State of New York, D Hart, R., Athalye, RA., Halverston, MA., et al. Pacific Northwest National Laboratory (2015). National Cost-effectiveness of ANSI/ASHRAE/IES Standard 90.1-2013, retrieved from: PNNL-23824 National Cost-effectiveness of ANSI/ASHRAE/IES Standard 90.1-2013, January 2015 Hart, R., Liu, B. US Department of Energy (2015). Methodology for Evaluating Cost-Effectiveness of Commercial Energy Code Changes, retrieved from: https:// www.energycodes.gov/sites/default/fi les/documents/commercial_methodology. Pdf December 2015

BUILDINGENERGY BOSTON

MARCH 7-9, 2017 • SEAPORT WORLD TRADE CENTER • NESEA.ORG/BE17

Conference + Trade Show of the Northeast Sustainable Energy Association (NESEA)

NESEA.ORG/BE17

Connect with thousands of high-performance building and renewable energy professionals.
See cutting-edge technology and grow your client base on the trade show floor.
Choose from over 50 accredited sessions and workshops to attend.

DOES ELECTRIC GRID 2.0 MEAN ENERGY DEMOCRACY?

BY JOHN FARRELL

PEER-REVIEWED BY STEPHAN WOLLENBURG

We need local grids to be operated like a commons, just like roads or the internet.

Whether it's smartphones in our hands or solar on our roofs, disruptive technology is rapidly transforming the way we get electricity. It's a change that should feel familiar.

Think about this: Most of today's high school students have never used a landline phone. Most of today's elementary students, like my kids, think that all phones can take pictures, play movies and send messages from anywhere. These disruptive devices have put unprecedented communication power in the hands of nearly every American.

The rise of distributed communication power, and its threat to landline phone companies, is being mirrored in the energy business. It has similar implications for the monopoly companies that control our electric grid.

For decades, these utility companies have been staid and secure. They relied on burning fossil fuels or splitting atoms to generate heat, boiled water for steam, and used steam to turn turbines and generate power. Bigger meant more efficient, so utilities invested in ever-larger power plants, with some generating enough power for hundreds of thousands of homes. The result was lower prices for electricity (and plenty of air pollution and/or radioactive waste).

The largely ignored cost was the concentration of capital and power into monopoly companies, much like the landline phone business.

A secondary cost of reliance on large power plants was slowing technological innovation. Utilities built fewer plants to serve the same demand. In recent years, demand has stagnated, further slowing even incremental improvement of existing fossil fuel or nuclear generation technology. As iteration and learning slowed, a culture of stagnation set in, reinforced by the lack of competition.

Now, new technology—from rooftop solar to smart thermostats to smartphones—is upending utility monopolies with rapid innovation.

Solar panels, for example, are mass-produced. The same panels grace home rooftops or massive utility-scale power plants. In 2014, a new solar array was installed every 150 seconds; today, it's nearly every 60 seconds. The rapid repetition in manufacturing, delivery, and installation drives innovation. Prices have fallen 80 percent in five years, and electricity from rooftop solar is now competitive (without subsidies) in over 20 states with the price home or business owners would pay for utility electricity. (See https://ilsr.org/newsolarparitymap/.) In the next decade, solar will be cheaper than utility electricity almost everywhere.

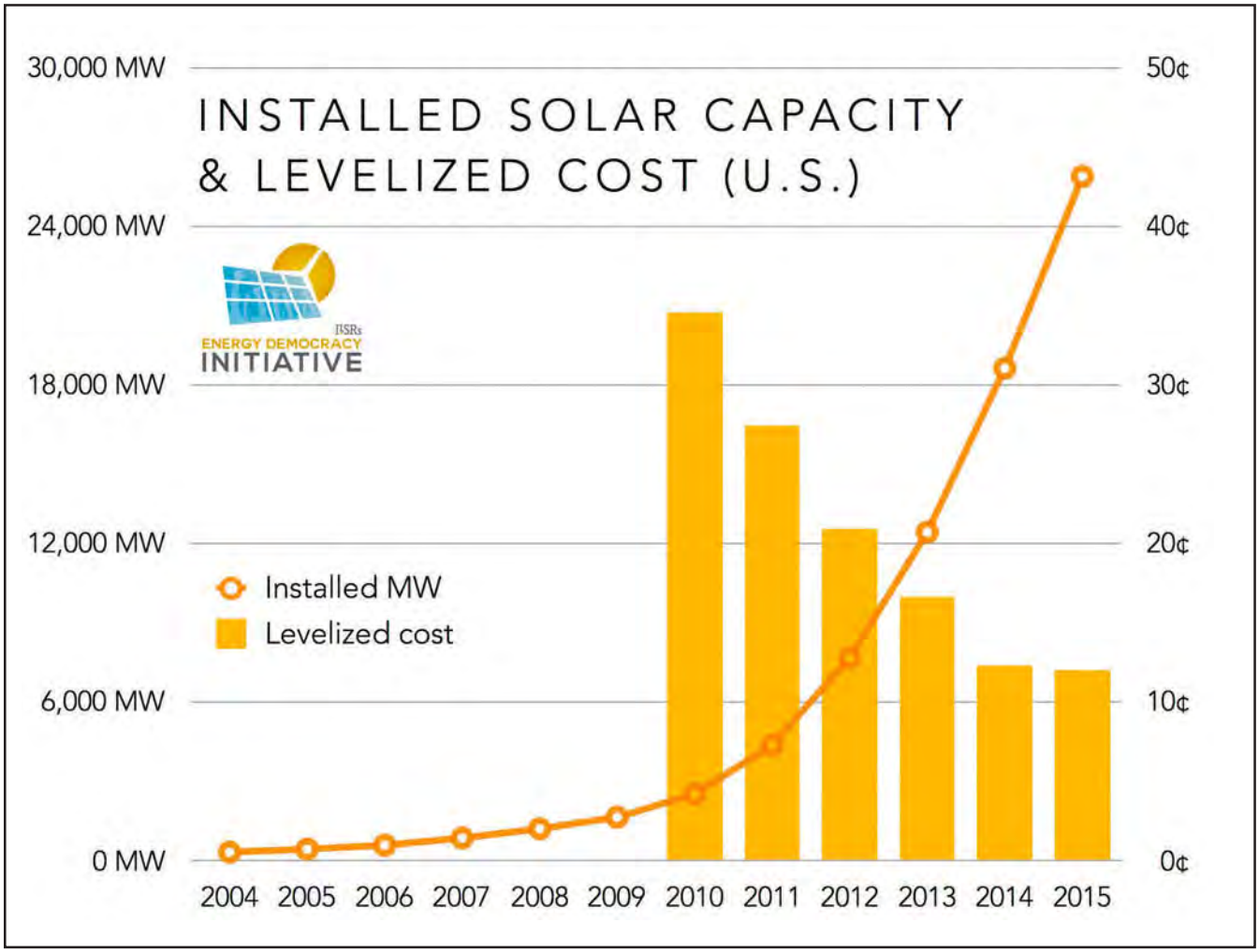
Costs for energy storage, such as batteries, are falling fast as well, driven by electric vehicles and the widespread adoption of mobile computing and smartphones.

Alternatives aren't just cheaper, they're smarter. Just as mobile phones made landline phones passé, smartphones are putting power in the hands of electric customers. New apps allow people to change thermostat or lighting settings (or tweak sophisticated building energy management software) with a tap or a touch, creating a new expectation of control. And much like solar panels, smartphones iterate remarkably fast. Your phone may have a useful life of a few years, but it's superseded by a new model within 12 months and its apps are updated regularly, even weekly.

Already this disruptive technology is changing the energy market.

In the small town of Minster, Ohio, city leaders were blindsided by a state legislative push by monopoly utilities to reduce revenue from solar. With their proposed solar array in limbo, a developer suggested they add a battery, helping to use the solar to avoid peak energy purchases from the grid, and also to help stabilize the grid's voltage and frequency. Now, the project is delivering nearly 10 percent of the town's electricity and using the battery to deliver essential services to the wider, de-monopolized electric grid (at a profit).

In Hawaii, rooftop solar is so affordable compared to utility electric prices that more than 15 percent of households have already installed solar panels. After utilities successfully reduced compensation for customer-produced solar last year, SolarCity started offering a bundled solar



SOURCES: SOLAR ENERGY INDUSTRIES ASSOCIATION, ILSR.

and battery system at lower-than-grid prices. The energy policy experts at Rocky Mountain Institute predict that within 20 years—half the useful life of most utility-built power plants—utility customers in every state will be able to get cheaper electricity on their own, combining inexpensive solar energy with low-cost energy storage.

These disruptive forces mean the electric system looks less like a monopoly than at any time since Thomas Edison's partner Samuel Insull first suggested utilities accept public regulation for government protection from competition. The result is that the entire $360 billion in annual electricity sales is up for grabs, and local communities stand to benefit.

The utility monopoly companies, however, along with the rules that govern them, are still stuck in the 20th century, and are holding the public interest captive.

Fortunately, we already know new rules can kickstart the next stage of innovation, just as they did the last. Thirty years ago, states began adopting net metering laws allowing customers to lower their bills by generating their own electricity. Renewable energy and energy efficiency standards followed in the late 1990s, and then requirements for targeted investment in distributed generation like solar. These changes have come as state legislatures realized that although utilities retained legal monopolies on power supply, they no longer had a technological one.

The 21st century electric grid rules should continue to shift us away from increasingly expensive fossil fuels and utility monopolies.

For one, we need local grids to be operated as a commons, just like roads or the Internet. The power of the network was recently displayed in New York, when monopoly incumbent Consolidated Edison was required to seek distributed resources like solar, storage and energy efficiency in lieu of a $1 billion upgrade to an electrical substation. The outside bidders provided the same power capacity for one-quarter the price.

We also need to shift from central management to distributed and transparent

In Hawaii, rooftop solar is so affordable compared to utility electric prices that more than 15 percent of households have already installed solar panels.

pricing that allows customers to offer their solar, storage or demand reduction in service of a more efficient electric grid. Hourly or "time of use" pricing has already been shown to reduce energy use at times of peak demand – and could be made more powerful if it applied not just to reducing consumption but also to increasing local energy production.

We need financing tools accessible to all, so that the $360 billion opportunity isn't confined to those with a prime credit score. Many cooperative utilities have already solved this problem, offering their customers "on-bill repayment" for investments in insulation, efficient furnaces and water heaters, and even on-site solar. These programs use on-time bill payment history rather than credit scoring, giving the vast majority of electric customers access to reduce and manage their energy consumption.

Without these changes, we risk having many (wealthier) utility customers cut the cord through solar panels and storage even when they could benefit (for reliability and economic reasons) from a grid connection, leaving behind a less valuable network and a more costly system.

So how do the rules change?

About one-quarter of Americans already control their electric company as either a publicly-owned municipal or member-owned cooperative. Some of these municipal and cooperative utilities already use distributed technology and tap their customers' interest in participating. Farmers Electric Cooperative in Iowa is one of the top utilities in the country in solar installed per customer, much of it owned by customers. The Georgetown, Texas municipal utility contracted for 100 percent wind and solar power beginning in 2017. Customers of these utilities can vote in city or board elections and pick leaders who will enable local renewable energy generation.

For the remaining 75 percent of customers served by investor-owned utilities, the path to taking back power is less straightforward. These companies increasingly abuse their publicly-granted monopoly to oppose the public interest in having more renewable energy and local control. Incumbent monopoly NV Energy, for example, lobbied to end fair "net metering" compensation for solar producers in Nevada. APS and Tucson Electric Power in Arizona have similarly tried to protect their monopoly by making customer-owned solar less lucrative.

One exception to monopoly rule by investor-owned utilities hints at a potential solution.

Green Mountain Power is an investor-owned utility serving about three-quarters of Vermont electric customers. It is the only electric company with an alternative corporate structure (called a certified B Corp., or benefit corporation) that requires the utility to pursue greater social goods in addition to shareholder profits, e.g. "to become

CONTINUED ON PAGE 24

CONTINUED FROM PAGE 22

It's a fundamental rewrite of the rules: to replace centralized control with distributed power.

the Ben and Jerry's of the utility world." Unlike most of its peers, Green Mountain Power has helped customers finance energy efficiency, solar, and energy storage; has developed local microgrids to deliver resilient power; and published maps of their distribution grid to help customers identify the best places to add new local power generation. To retain their monopoly, we could require utilities to restructure as benefit corporations to more clearly serve the public interest. It might not magically make them into another Green Mountain Power, but it would provide additional legal leverage to insist on better behavior.

For utilities unwilling to embrace the public interest in exchange for a continued monopoly, regulatory restructuring, like the kind New York is pursuing in its "Reforming the Energy Vision," can provide access to the grid and an open marketplace for non-utility individuals and businesses to innovate. It's a fundamental rewrite of the rules: to replace centralized control with distributed power.

There's no one-size-fits-all set of rules for a 21st century electric grid, but there's one universal principle: if the technology and economics have made last century's grid an archaism, then it's time to adopt rules that enable the transition from energy monopoly to energy democracy.

ABOUT THE AUTHOR

John Farrell *is the Director of Democratic Energy at the Institute for Local Self-Reliance and widely known as the guru of distributed energy. John is best known for his vivid illustrations of the economic and environmental benefits of local ownership of decentralized renewable energy. He's the author of* Energy Self-Reliant States, *a state-by-state atlas of renewable energy potential highlighted in the* New York Times, *showing that most states don't need to look outside their borders to meet their electricity needs.*

ABOUT THE PEER REVIEWER

Stephan Wollenburg, *co-chair of the 2017 BuildingEnergy Boston Conference + Trade Show, is an independent consultant focusing on renewable energy procurement and demand response markets. Before going solo, he worked at the Cape Light Compact and Mass Energy Consumers Alliance. Stephan received extra credit in a college class for attending his first BuildingEnergy Boston Conference, though he insists he attended because he was a true believer. Either way, he was hooked. Some find his love of numbers (especially spreadsheets!) somewhat off-putting, but tolerate it because he uses it for good.* MEMBER

NESEA Business Memberships Just Got Even Better.

NESEA MEMBERSHIP

Now All Your Employees Enjoy These Great Member Benefits

- Member pricing on BuildingEnergy Conferences, Pro Tours, and Master Series Courses
- Access to and listing in NESEA's members-only directory
- Invitation to volunteer at NESEA conferences and events
- Listing in NESEA's BuildingEnergy Green Pages Business Directory, including company description and logo
- Invitation to participate in BuildingEnergy Conferences Planning Committees
- Member pricing for advertising in *BuildingEnergy* Magazine
- Member pricing for exhibit space at BuildingEnergy conferences
- Invitation to participate in BuildingEnergy Bottom Lines
- Ability to advertise job vacancies on NESEA's online jobs board
- Invitation to host a BuildingEnergy Pro Tour
- Access to a community of building science experts

Interested? Learn more about the benefits of becoming a NESEA Business Member at nesea.org/business-member.
Questions? Contact Katie Schendel, Membership Manager, at kschendel@nesea.org or (413) 774-6061 ext. 20.
NESEA Business Memberships start at $250. Individual memberships are also available.

RESILIENCY FOR AFFORDABLE MULTIFAMILY HOUSING: WHAT WE HAVE LEARNED AND WHAT WE STILL NEED TO KNOW

BY MARK GINSBERG, FAIA, LEED AP

PEER-REVIEWED BY STEVEN BLUESTONE

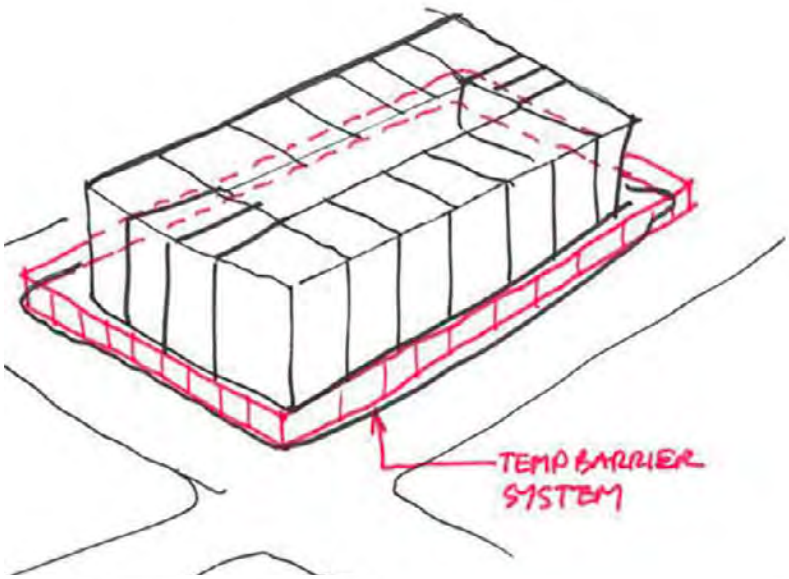
My experience with resiliency has developed through my work, both before and largely after Hurricane Sandy (2012), and through my research and advocacy roles as a member of several civic non-profits, including the American Institute of Architects New York Chapter (AIANY) and Citizens Housing and Planning Council (CHPC). In 2007 my firm, Curtis + Ginsberg Architects LLP, designed a multifamily project which raised the ground floor about 18 inches above the flood elevation. This was a considerable amount at that time, but ultimately not enough, given that we have learned from Sandy. This article summarizes what I have learned about resiliency since then, particularly related to flooding and its impact on multifamily and affordable housing in New York City (NYC) in the aftermath of Sandy. Although much progress has been made, much, as you will see, remains to be done.

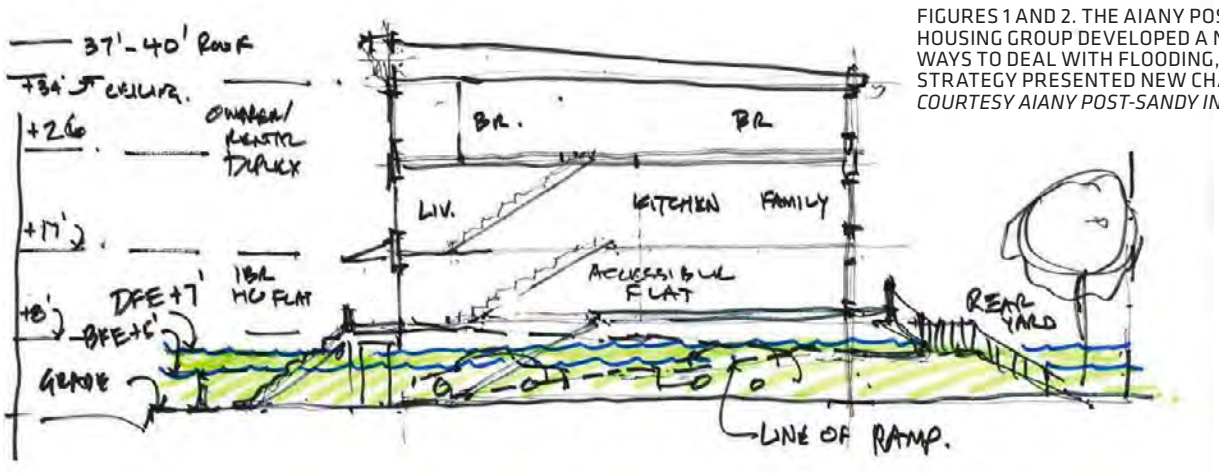
A LOOK AT NYC BUILDING AND ZONING CODES POST-SANDY

My first involvement in the aftermath of Sandy was at CHPC, where I chaired a committee reviewing issues of resiliency. We quickly realized that the NYC Building Code flood elevations were out-of-date and there were no provisions for climate change and sea-level rise. The NYC Zoning Resolution was in much worse shape; the only resiliency provision was that building height was measured from base-flood elevation. How resiliency needs affected the complicated rules of the Resolution and the real world requirements of housing and urban design had not been systematically reviewed.

Our reading of these documents revealed that:

- Flood elevations were 30-years-old, out-of-date, and did not take into account climate change/ sea-level rise. The good news was that the Federal Emergency Management Agency (FEMA) had started working on this several years earlier. Preliminary maps were released quickly, and NYC allowed these preliminary maps to be used as a basis for development of NYC-specific elevations.





FIGURES 1 AND 2. THE AIANY POST-SANDY HOUSING GROUP DEVELOPED A NUMBER OF WAYS TO DEAL WITH FLOODING, BUT EACH STRATEGY PRESENTED NEW CHALLENGES. *COURTESY AIANY POST-SANDY INITIATIVE.*

- None of the codes took, or currently take, into account sea-level rise or give any flexibility for sites located in the 500-year flood zone.

Even if we were to plan adequately for "the next Sandy," the next disaster will not be exactly like the last. Sandy provided tremendous storm surge, but the amounts of wind and rain were not excessive. Along with storms, we should also be thinking about earthquakes, heat events and man-made disasters.

POST-SANDY TASK FORCE

Less than a month after Sandy, I was asked to co-chair the "Housing Group" of the Post-Sandy Task Force organized by the AIANY. One of our first tasks was to look for best practices. We reached out to major AIA, American Planning Association, and American Society of Landscape Architects chapters, and received only one landscape architecture best practice study from New Orleans. FEMA had two excellent manuals on how to flood-proof one- and two-family houses, but nothing on multifamily. We also had discussions with those at the NYC Department of City Planning (DCP), who realized they needed to quickly update the Zoning Resolution. We worked with DCP to organize a day-long charrette, with 80 participants and observers from many public agencies, to study various options. The presentation of the Post-Sandy Task Force, including a slide show of the material developed at the charrette, can be viewed at http://postsandyinitiative.org/.

We developed a number of inventive ways to deal with flooding *(see figures 1 and 2)*, and new questions emerged with respect to each new strategy. For example, raising a building five to ten feet above grade created major urban design issues at the street level. We developed solutions to lessen the impact of buildings on stilts or pilotis, which required emergency short-term revisions to the Zoning Resolution by the Department of City Planning. These revisions included a combination of provisions for stair switchbacks, plantings, porches and decks to be required in the zoning changes.

FEMA standards required egress from dry-flood-proofed buildings, but not wet-flood-proofed buildings *(see figures 3 and 4)*. FEMA's expectation is that everyone would be evacuated before a flood; however, in a dense urban environment such as New York City, full evacuation is unlikely if not impossible. It is therefore important to have a way for people to get out of a building during a flood from a wet-flood-proofed building *(see figures 5)*.

We also looked at the need for insurance programs to recognize partial compliance. Flood-proofing new construction is relatively easy, with limited cost implications. Flood-proofing existing buildings is much more complicated, since they typically cannot be raised, and abandoning a floor of a five-story building can reduce building income by 20 percent (based on a loss of 20 percent of the housing units). Changes to the Federal Flood Insurance Program will mean that buildings that do not fully comply with FEMA standards will lose their insurance subsidy, which, in some cases, will raise rates tenfold. Until recently, there was no discussion of partial compliance reducing insurance rates.

FIGURE 3

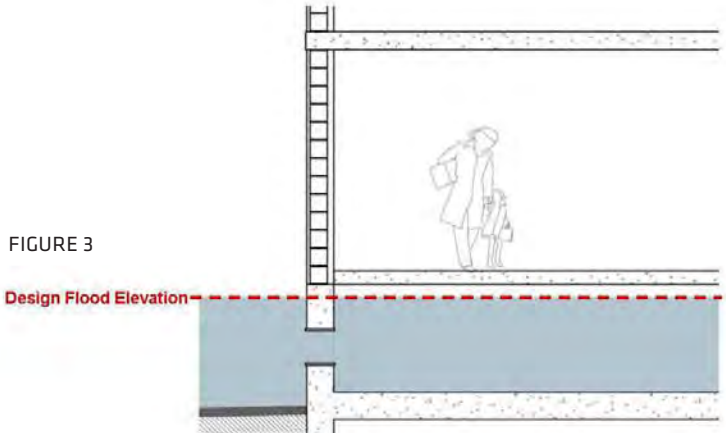


FIGURE 4

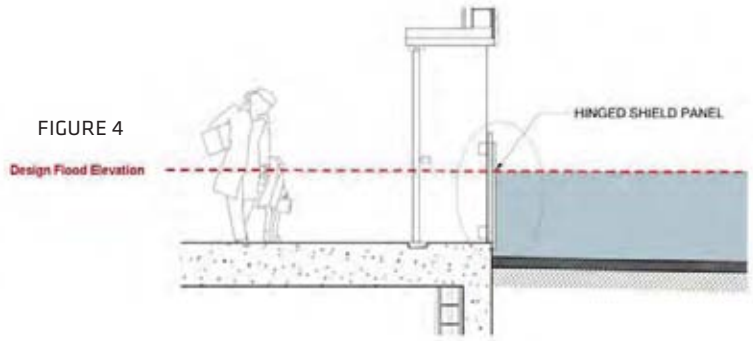


FIGURE 5

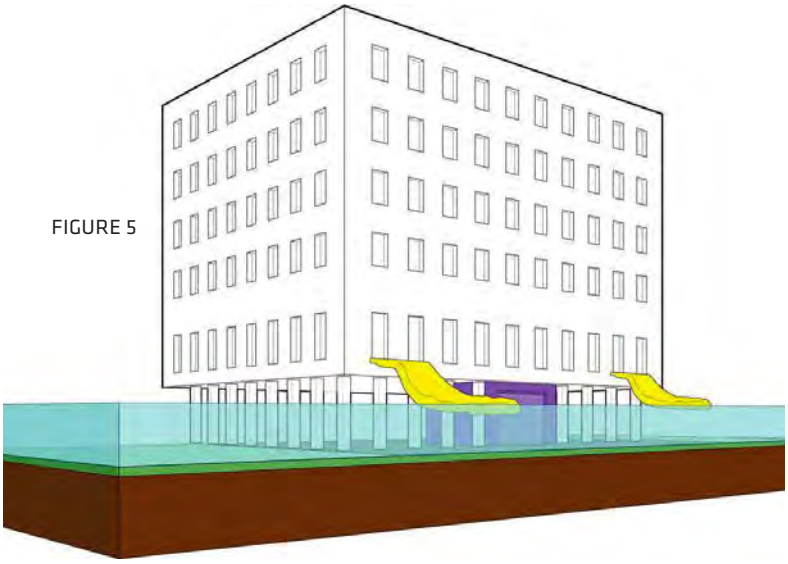


FIGURE 3 AND 4. DRY- AND WET-FLOOD-PROOFING MODELS.
FIGURE 5. EMERGENCY EXIT SLIDES FROM A WET-FLOOD-PROOFED BUILDING. *IMAGES COURTESY AIANY AND THE POST-SANDY INITIATIVE.*

FIGURE 6

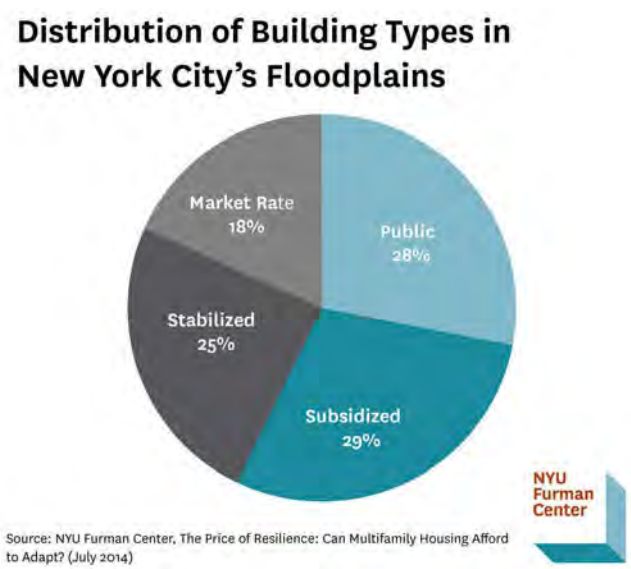


FIGURE 7

FIGURE 8

RESILIENCY COSTS

New York University's Furman Center examined the work that AIANY did and asked these questions:

- If flood-proofing measures were implemented, what would it cost?
- How would flood-proofing measures affect revenue?
- How could such measures be funded?

I was asked to partner in this line of inquiry. The data collected demonstrated the vulnerability of the affordable multifamily housing stock; 18 percent of affected housing was market rate, while the remainder was subsidized, stabilized, or public. *(see figure 6)*. Three case-study sites were selected, and the Furman Center convened a workshop with a number of people from the Post-Sandy Charrette, along with experts in financing, costs, funding and development to look at these issues. The resulting report, *Multifamily Housing in NYC and Other Urban Areas Remains Vulnerable to Flooding,* can be downloaded at http://furmancenter.org/thestoop/entry/three-years-post-sandy-multifamily-housing-in-nyc-and-other-urban-areas-sti.

To help preserve needed affordable housing currently located in the floodplain *(see figures 7 and 8)*, the report recommended that:

- FEMA should modify the guidelines for its National Flood Insurance Program to allow for coverage of existing multifamily buildings.
- New York City should expand its Flood Resilience Zoning Text Amendment to cover buildings in the 500-year floodplain. (This was also a recommendation of the Post-Sandy Housing Task Force.)
- NYC should revisit its existing rehabilitation programs to ensure that resilience measures can be readily funded; and it should require that buildings in the 100-year and 500-year floodplains that receive city assistance have adequate emergency and resilience plans.

One of the major issues raised, and not fully answered, is how resiliency measures are funded. With the exception of post-disaster rounds of funding, there are typically no mechanisms in place to provide funding for resiliency. One clear path is to tie resiliency funding to energy retrofit programs, which, in New York, are run by the New York State Energy Research and Development Authority (NYSERDA). Although NYSERDA cannot legally fund resiliency measures, they can provide information and links on their website relating to resiliency issues when doing energy upgrades. One example of how this might work is when someone is replacing a boiler they are pointed to a resource demonstrating that it can be relocated for resiliency, often at a small additional cost.

CONTINUED ON PAGE 30

The Flats at The Upper Ridge
LEED Silver Condominiums

Kuhn Riddle Architects

R.W. Kern Center
Hampshire College - Living Building

Bruner/Cott Architects

The Hitchcock Center for the Environment - Living Building

designLAB Architects

New Home - Amherst, MA

Accessory Living Space Addition
Belchertown, MA

Innovation. Collaboration. Results.

WRIGHT BUILDERS
(413) 586-8287 e.104
wright-builders.com

$(PV)^2$
PV Squared

Your trusted partner in solar.

Solar can be confusing. So we make the process clear and simple. We're a Certified B Corp and worker-owned cooperative. Which means we care about doing things right. And our team of experts is here for you. Today, tomorrow, and down the road.

www.pvsquared.coop

Certified B Corporation
SUNPOWER® Elite Dealer

MA Elec. Lic. A13764 MA HIC 140077

VENTILATION SOLUTIONS FOR EVERY SEASON

RENEWAIRE
THE COLD WEATHER ERV

FROST-FREE OPERATION · NO DRAIN PANS
ENERGY EFFICIENT · TEMPERS INDOOR AIR

RST THERMAL
RenewAire Energy Recovery Ventilation
RSTThermal.com
781.320.9910

CONTINUED FROM PAGE 28

Where uncertainty is an issue, strategic flexibility is important.

MULTIFAMILY RESILIENCY

Enterprise Community Partners took up the challenge of developing a resiliency manual for multifamily affordable housing, to which I was a senior contributor. The result is called *Ready to Respond: Strategies for Multifamily Building Resilience* and can be downloaded at http://www.enterprisecommunity.com/resources/ResourceDetails?ID=0100907

Although the efforts and report are targeted toward affordable housing, most of the recommendations are equally valid for market-rate housing. The manual addresses 19 strategies, though not all will be applicable to all projects and localities. Not only does the manual describe physical changes that can be implemented to make a building more resilient, it also describes organizational and planning policies that increase the resiliency in a building.

FIGURE 9: REBUILD RESILIENT STATEN ISLAND HOUSE, ONE OF 35. *RENDERING COURTESY OF CURTIS + GINSBERG ARCHITECTS LLP.*

Of major importance is creating buildings that are passively resilient. A "passive house" building will inherently be resilient; without power or fuel it will not get as hot in summer or as cold in winter. Emergency power systems and generation and storage at the building will go further in maintaining the operations of these buildings. In short, a more energy efficient building is a more resilient building.

Many of us are excited that FEMA is studying flood insurance standards for partial resiliency. The manual describes the strategies, but once partial resiliency standards are released it will need to be updated. The manual contains a matrix that allows the reader to identify resiliency strategies based on the details of the building. At some point, creating an interactive, web-based manual will enable a more nuanced approach.

LEARNING FROM PRACTICAL EXAMPLES

In my own practice, we have been doing a number of resilient projects including replacement homes damaged by Sandy in Staten Island. This project encompasses 35 highly energy-efficient, single and two-family residences, three of which are Passive House Certified *(see figure 9)*. We have also designed a 101-unit affordable apartment building in the Rockaways that just topped out and is currently the largest Passive House building in construction in the U.S. *(see figure 10)*. Other projects include the renovation of an existing building in the flood zone on the Lower East Side and resiliency upgrades to three New York City Housing Authority (NYCHA) developments comprising 12 buildings in Coney Island.

What have we learned from our resiliency practice in the real world?

- New construction is much easier than renovating existing buildings.
- Each site is different, with different flood elevations, wind velocity considerations, and specific site issues.
- Although the codes are better today than pre-Sandy, often they still limit going beyond the minimum requirements for flood-proofing. In many instances it is hard to go beyond code minimums in designing for future sea-level rise.
- Even if one can design for sea-level rise it is hard to know what to design for. The science is very unclear, with predictions of rise between two and eight feet by 2100. Where uncertainty is an issue, strategic flexibility is important.
- We need to develop strategies to deal with the longevity of NYC buildings (the average age is 60 years), and the fact that they are typically situated on a block with party walls and adjacent buildings. For example, you want a row of buildings to flood at an even rate and then be pumped out evenly: otherwise, there will be structural stresses on the foundation and potential additional damage.

NEXT STEPS

So where are we four years after Sandy? We have taken a number of steps to update codes and regulations to mandate and encourage resiliency, but much still needs to be done:

- Regulations should allow for, and ideally mandate, designing for climate change. The 500-year storm will be the 100-year storm in 20 or 30 years. We should therefore be designing buildings that will be fully resilient in 20 or 30 years. Otherwise, presuming flood insurance does not change with the current remapping of flood zones,

FIGURE 10. EDGEMERE APARTMENTS; THE LARGEST BUILDING UNDER CONSTRUCTION IN THE WORLD THAT IS FOLLOWING THE PASSIVE HOUSE INSTITUTE US (PHIUS) CERTIFICATION PROCESS.
CURTIS + GINSBERG ARCHITECTS LLP, RENDERING COURTESY OF GLOBAL DESIGN STRATEGIES NY.

buildings will become non-compliant. A number of professionals have recommended that the 500-year flood zone and elevations become the basis for resilient building codes instead of the 100-year flood zone elevation as a first step. This will buy us 20 or 30 years, if history holds, and if the rate of unprecedented flooding continues to increase. One stumbling block is that FEMA does not publish 500-year elevations.

- Flood insurance standards should give credit for partial resiliency, since it will be impractical to raise most multifamily buildings. Partial resiliency should be encouraged since it will significantly lower the risk of flood damage.
- There are areas where individual building resiliency does not make sense, and district, or block, resiliency through a large-scale project is the only reasonable option. See the 'Big U' as a concept for protecting Lower Manhattan, a public infrastructure project that will be much less costly than retrofitting each building. www.rebuildbydesign.org/project/big-team-final-proposal/.
- In some areas strategic retreat will make sense. This depends on which sea level rise projections one uses. Areas that are projected to be 15 feet below the flood zone will flood on a daily basis and will be uninhabitable unless we invest a lot of money and great effort.
- In some areas, particularly those with older buildings, demolition and rebuilding will make more sense than shouldering the cost of abandoning 20 percent of the units to make a building resilient (20 percent would mean abandoning the first floor of a typical five-story tenement). While such a strategy may make economic sense, in many cases such buildings are located in neighborhoods that have character, and demolition would create backlash from urban design, landmark and community perspectives. One size does not fit all.

ABOUT THE AUTHOR

Mark Ginsberg, FAIA, LEED AP, *is a founding partner of Curtis + Ginsberg Architects LLP, whose practice covers commercial, institutional, planning and residential projects. A native New Yorker, Mark has developed resiliency strategies as Chair of the Citizen's Housing and Planning Council Post-Sandy Code Committee; and co-chair of the Post-Sandy Housing Task Force organized by the American Institute of Architects New York Chapter.* MEMBER

ABOUT THE PEER REVIEWER

Steven Bluestone *is one of the five managing owners of The Bluestone Organization, a third-generation family business that builds, develops and manages buildings in the New York City area. Steven's personal interest in the environment dates back to the 1970s and can be seen in the home he and his wife designed and built 13 years ago, where they still live today.* LIFETIME MEMBER

Attend a Pro Tour in 2016

See cutting edge technology and innovative high-performance building projects firsthand. Make valuable connections and improve your practice.

CEUs available: AIA LU|HSW and BPI

BUILDINGENERGY PRO TOURS

Remaining Tours in 2016

Passive Construction on a Working Farm
September 16 • Westport, MA

Intelligent Home Technology in Net Zero Construction
October 7 • New Boston, NH

Custom Foam-Free Passive House
October 21 • Wayland, MA

Passive, Net Zero Timberframe + Data
November 18 • Lancaster, NH

Maynard Passive House
December 2 • Wakefield, RI

Thanks to the 2016 Pro Tour Series Sponsors

BENSONWOOD

ZIPsystem™ SHEATHING & TAPE

Learn more at: nesea.org/protours

BuildingEnergy Pro Tours are a Program of the Northeast Sustainable Energy Association (NESEA)

BREAK IT OR LOSE IT: THERMAL BRIDGING IN RAINSCREEN SYSTEMS

BY ANDREA LOVE

PEER-REVIEWED BY HANNAH DURSCHLAG

INTRODUCTION

Over the past 20 years, the building industry has experienced renewed interest in reducing the energy demand of buildings. At the building code level, groups such as the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) have been steadily raising the bar on performance criteria for building envelopes and systems. Designers have been challenged to find and implement technologies and solutions that can practically and economically affect the energy demands of our buildings. Less progress has been made, however, in managing conductive losses through improved building insulation performance. Increased thickness of insulation materials provides diminishing returns if thermal bridging is not considered (see *figure 1*).

The intent of this research is to quantify and understand how built façades perform, and also to investigate proposed improvements to common problem details. Results show that it is possible to reduce thermal bridging by 50 percent or greater by employing careful detailing and products that are readily available.

METHODOLOGY OVERVIEW

The research project was comprised of a multi-step approach, starting with field observations of existing assemblies, followed by computer simulations of existing details and proposed thermal improvements. Hand calculations of R-values based on the resistance of each layer of the envelope were derived from shop drawings, construction documents and/or specification information as appropriate.

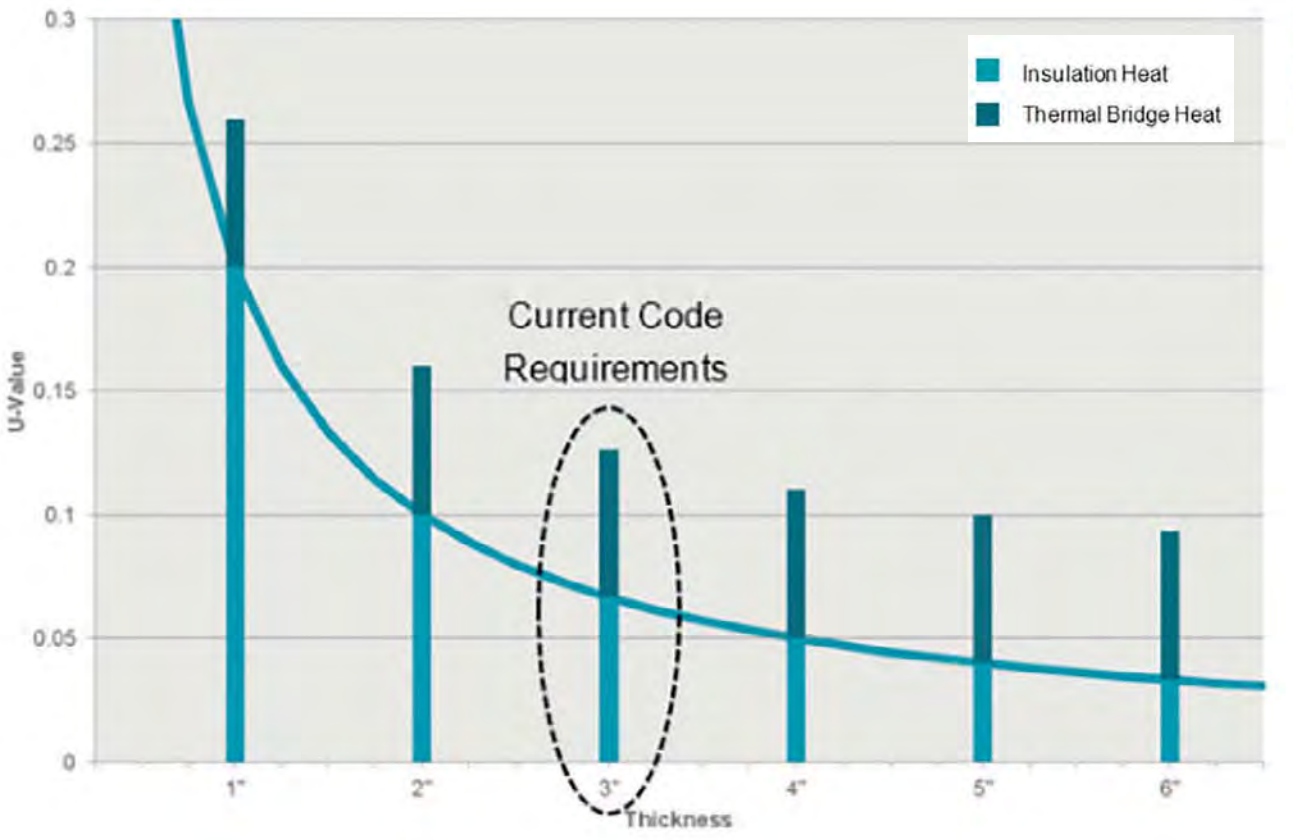


FIGURE 1: CHART OF HEAT FLOW THROUGH WALL ASSEMBLY SHOWING INCREASED IMPACT FROM THERMAL BRIDGES.

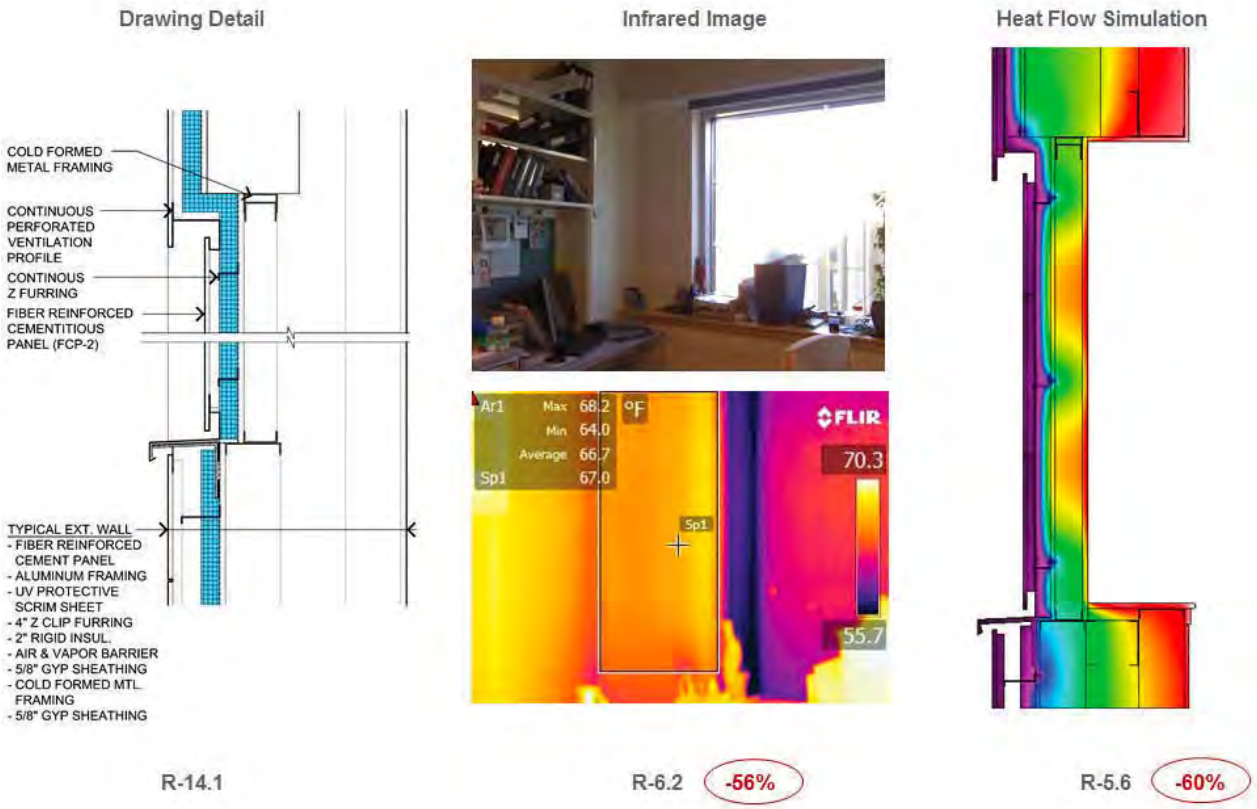


FIGURE 2: EXAMPLE OF RAINSCREEN STUDY SHOWING INTENDED DETAIL AND R-VALUE, AS WELL AS THE R-VALUE OBSERVED FROM A THERMAL IMAGE AND THROUGH THE HEAT-FLOW SIMULATION.

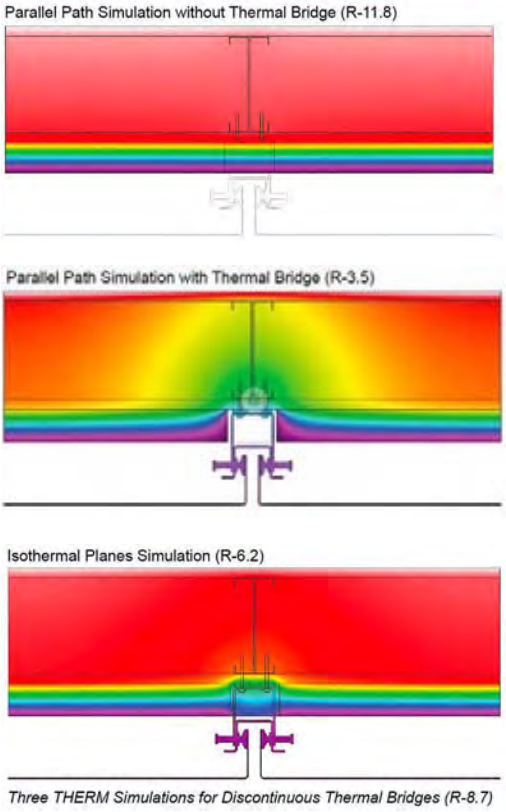


FIGURE 3: THREE THERM SIMULATIONS FOR DISCONTINUOUS THERMAL BRIDGES (R_{IP}-8.5).

Because these simplified, single-dimension calculations do not account for any thermal bridging, they were used as the "baseline R-value" as the best-case scenario.

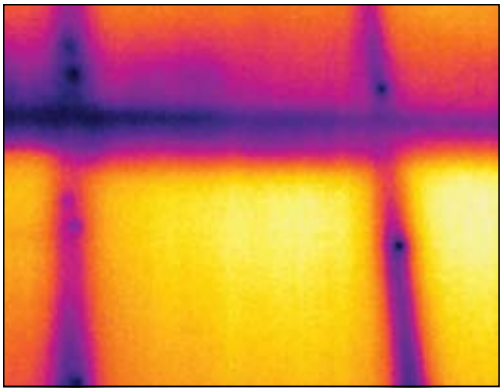
A thermal imaging camera was used to determine the actual R-value of existing façades. Teams were deployed to 15 buildings to assess the general envelope thermal performance and scan for areas that appeared to perform differently. Using the methodology published by Madding (2008), the exterior air temperature, interior air temperature and the radiant temperature were gathered using infrared imaging and temperature data loggers in order to calculate the as-built R-value of the assembly *(see figure 2)*.

Because physically altering the built conditions was not possible, computer simulations were used to test possible improvements to various construction details. Lawrence Berkeley National Laboratory's THERM 7.3 program was employed to determine R-values of complete assemblies, including thermal bridges, based upon its ease of use and ability to integrate into the design process. For each detail, models were prepared of the constructed designs and were then calibrated by comparing them to the actual performance measured in the field with the thermal imaging camera. For discontinuous thermal bridges, such as bolts or clips, two methods were used to account for their three-dimensional impact: the parallel path method and the isothermal planes method.

The parallel path method takes a weighted average of two simulations, one with the discontinuous bridging element and one without it. The isothermal planes method runs one simulation using a weighted conductivity of the bridging material and insulation for the discontinuous thermal element. Because the parallel path tends to overestimate the impact of the thermal bridging, and the isothermal planes tends to underestimate the impact, both methods were used to understand the range of impact the thermal bridge might have *(see figure 3)*.

CONTINUED ON PAGE 37

Project: "Mid Coast Green" | Architect: Green Design Studio | Builder: Kolbert Building



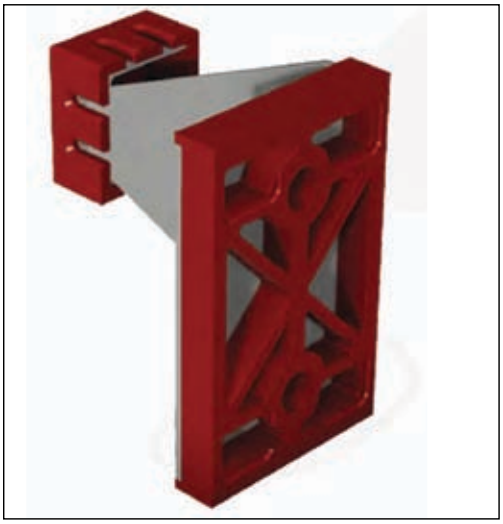


FIGURE 4: AT THE TOP LEFT IS A THERMAL IMAGE OF Z-GIRT SUPPORT FOR A RAINSCREEN. OTHER EXAMPLES SHOWN ARE THOSE OF THERMALLY BROKEN RAINSCREEN SUPPORTS. *PRODUCT IMAGES BY CASCADIA WINDOWS AND KNIGHT WALL SYSTEMS.*

CONTINUED FROM PAGE 35

Working from both the graphical and quantitative output from THERM, models were strategically probed to identify the significant heat transfer elements within a given detail, and ultimately predict the performance improvements that might result from changes in detailing.

CASE STUDY ON RAINSCREENS

The investigation fell into two categories: façade systems, and assembly transitions. The most thermally problematic transition conditions were found at window installations, foundation-to-wall transitions, changes in wall systems, soffits, roof-to-wall transitions, parapets, roof penetrations, louver openings, existing buildings with embedded beams and slabs and seismic and movement joints.

Five basic façade systems were identified that would be generally applicable to modern commercial and institutional work and appeared to reflect different challenges. These were: rainscreens, masonry veneer walls, insulated metal panels, curtain walls and the renovation of existing masonry façades.

Rainscreens are popular for commercial façades due to their ability to control air and moisture movement. Because the cladding is held off the wall, these systems require a secondary structural system of rails, Z-girts and/or clips to support the cladding. Typically made of highly conductive metals, these members penetrate through the insulation, causing significant thermal bridges. While insulation between steel studs has long been acknowledged to cause thermal bridging, these rainscreen supports have a similar impact thermally that was overlooked until recently.

In thermal images of rainscreen façades, a decrease in thermal performance that ranged from 20 to 60 percent less than the design intended performance was observed, with the majority around a 45 to 55 percent decrease. The systems selected for study all had between two and three inches of insulation with various support systems, such as vertical and horizontal Z-girts, as well as different clip systems. In both vertical and horizontal orientations,Z-girts demonstrated an R_{SI}-1.2 (R_{IP}-7.7) reduction in the assembly's

Results show that it is possible to reduce thermal bridging by 50 percent or greater by employing careful detailing and products that are readily available.

R-value or, roughly a 45 to 55 percent reduction in performance depending on the insulation thickness. Because of the intermittent nature of the rainscreen clips, they performed better both in thermal images and in the computer modeling than the continuous Z-girts. The clip support system had half of the heat flow of the Z-girts, or 25 percent of the design intent. While the intermittent nature of the support system certainly improved the performance, the team investigated methods to further improve the performance of rainscreen support systems *(see figure 4)*.

A number of thermally broken Z-girt and rainscreen support systems currently exist on the market. As part of the research project, the team explored four thermally-broken options. All four of the tested systems performed well. In general the R-value of the assemblies was only reduced by 10 to 15 percent due to thermal bridging through their support systems so that they achieved a minimum of R_{SI}-3.5 (R_{IP}-20) with four inches of insulation.

CONCLUSION

The continuity of a thermal barrier across the entire building envelope is fundamental to good thermal performance. It reduces energy consumption, increases thermal comfort and helps to prevent condensation. While some thermal bridges may be eliminated, the real goal of the research suggests that thermal bridges can be effectively managed, and that doing so will have a meaningful impact on the performance of buildings.

The first priority should be to eliminate continuous conductive elements, such as Z-girts or masonry shelf angles that completely penetrate the insulation layer. These systems are easily interrupted by pulling them outboard of the thermal barrier and using discontinuous supports to make required connections back to structure. Second, try to utilize available thermally broken products or strategies to disconnect the heat flow through the thermal barrier. Thermally broken rainscreen support systems, brick ties and concrete slab connections are readily available on the market. It is essential, however, to ensure that the thermal break occurs within the insulation boundary in the application of these products. The research found some products that are easily foiled by having breaks in undesirable locations relative to the natural placement of insulation. Finally, when the thermal bridge is a necessity, such as when structure must penetrate uninterrupted through the insulation, look for materials with the lowest possible thermal conductivity. For example, stainless steel has one-third the conductivity of carbon steel, and fiberglass's conductivity is significantly lower than that of stainless steel.

While this study is not intended to be an exhaustive analysis of all thermal bridges, it does identify the types of conditions that occur typically, and helps quantify their localized impact. More than anything, it is anticipated that this research will help to develop an intuitive understanding of the situations that lead to the thermal bridging regardless of the specific project conditions, and provide the tools for easily addressing them.

ACKNOWLEDGMENTS

This research received financial support from the American Institute of Architects Upjohn Research Grant and Payette Associates.

REFERENCES

ASHRAE. *2009 ASHRAE Handbook Fundamentals.* Atlanta, GA: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 2009.

ASHRAE. *ANSI/ASHRAE/IESNA Standard 90.1-2007 Energy Standard for Buildings Except Low-Rise Residential Buildings.* Atlanta, GA: ASHRAE, 2010.

Griffith, Brent, Elizabeth Finlayson, Mehrangiz Yaz, and Dariush Arasteh. "The Significance of Bolts in the Thermal Performance of Curtain-Wall Frames for Glazed Façades." *1998 ASHRAE Winter Meeting.* San Francisco, CA: ASHRAE, 1998.
Lawrence Berkeley National Laboratory. *THERM 6.3 / WINDOW 6.3 NFRC Simulation Manual.* Berkeley, CA: Regents of the University of California, 2011.
Love, Andrea. *Material Impacts on Operational Energy Usage.* Masters Thesis, Cambridge, MA: Massachusetts Institute of Technology, 2011.
Lstiburek, Joseph. *BSI-005: A Bridge Too Far.* Building Science Insights, Building Science Corporation, 2008.
Lstiburek, Joseph. *Thermal Bridges Redux.* BSI-062, Building Science Corporation, 2011.
Madding, Robert. "Finding R-Values of Stud Frame Constructed Houses with IR Thermography." *InfraMation 2008 Proceedings vol. 9.* Reno, 2008.
Morrision Hershfield. *Thermal Performance of Building Envelope Details for Mid- and High-Rise Buildings (ASHRAE 1365-RP).* Atlanta: ASHRAE Technical Committee 4.4, 2011.

ABOUT THE AUTHOR

Andrea Love *is the Director of Building Science at Payette, a Boston-based architecture firm. She leads the firm's sustainability and research efforts, working across all projects to improve the building performance. She was the recipient of the 2012 AIA Upjohn Research Grant, investigating the thermal performance of façades, and leads other internal research projects exploring strategies to improve building performance. She has an architecture degree from Carnegie Mellon and a Master of Science in Building Technology from MIT, where she received the Tucker Voss Award. She is also a Lecturer at MIT in the Building Technology program. She currently serves on the Board of Directors for the USGBC Massachusetts Chapter and the national USGBC Chapter Steering Committee and Education Steering Committee. She also serves on the AIA national COTE Advisory Group and 2030 Reporting Working Group.*

ABOUT THE PEER REVIEWER

Hannah Durschlag *has experience assessing the condition, insulation, airtightness and water penetration resistance of existing structures as well as in peer review for new building enclosure design. She has assisted in projects ranging from large-scale air leakage testing research to drawing reviews, in addition to thermal and hygrothermal computer modeling. Hannah is currently an enclosure consultant at Vidaris, Inc. Prior to joining Vidaris, Hannah was an associate at Wiss, Janney, Elstner Associates. She has a degree in civil engineering from Northwestern University and a Master of Science in Building Technology from MIT, where her research focused on the air leakage of concrete forms, concentrating on a comparison to typical wood frame construction.*

MY PEI IS BETTER THAN YOUR PEI

USING PERSONAL ENERGY INTENSITY (PEI) TO INFLUENCE OCCUPANT BEHAVIOR AND MAXIMIZE ENERGY PROJECT IMPACT

BY SAHEEL CHANDRANI

PEER-REVIEWED BY SUSAN MAZUR-STOMMEN

Despite the fact that owners, developers, consulting engineers and vendors have all endeavored to design, build and operate the most efficient buildings possible over the past decade, our buildings continue to consume almost 50 percent of all energy in the U.S., according to the United States Energy Information Administration (US EIA). We have developed and adopted various building codes, energy efficiency standards and design methodologies, all of which contribute to the increased efficiency of our buildings. We have successfully tackled large, complex engineering problems. We have developed and implemented technologies that drive peak performance of our mechanical and electrical systems. We have done all these things in service of a common end goal: to reduce the overall energy impact of our buildings on the environment. We hold our buildings' operational staff accountable for energy performance, but we should also be providing building occupants with the education and tools they need to reduce their energy intensity. This is the next frontier in keeping building performance at peak levels.

The U.S. Green Building Council (USGBC) estimates that approximately 1.85 million square feet of green building space is being rated through its Leadership in Energy and Environmental Design (LEED) system on a daily basis. In addition to LEED, Energy Star, Green Globes and the Living Building Challenge are all highly effective green building rating systems. These processes and design methodologies ensure that the core operations of our buildings are as efficient as possible from a design perspective. Through various upgrades and improvements, we've also learned to keep our buildings performing their best as they age.

An often overlooked, yet important, factor to maintaining peak operating performance is the human element. We have traditionally designed spaces with centralized and generalized control, leaving the vast majority of occupants without the ability to control their individual spaces. Since our building occupants impact overall energy spend tremendously, it is critical to develop Key Performance Indicators (KPIs) that quantify the successes of various energy programs and strategies vis-à-vis building occupants.

We have developed the Energy Use Intensity (EUI), which compares the total kBtu of a building with its gross square footage, allowing us to compare different types and sizes of buildings to one another.

We can use a similar concept to compare energy use of individual occupants of a building. This metric is known as Personal Energy Intensity (PEI), and is measured in energy dollars per occupant per day.

A recent analysis of approximately 50 buildings in New York City, all commercial office buildings with multiple tenant types, and all with Building Automation Systems (BAS's), revealed an average PEI of $13.25 in energy spent per occupant per day. Occupant behavior in these buildings ranged from a PEI in excess of $27.62 in buildings with the least efficient occupants, to a PEI of less than $6.19 for for the best performers. The data used for these calculations is publicly available through the following websites: http://benchmarking.cityofnewyork.us/, https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager, and http://www.eia.gov/consumption/commercial/.

It is one thing to be able to measure the impact that individual building occupants have on energy performance. It is quite another to get them to care about their impact. Getting buy-in from occupants has traditionally been one of the harder aspects of successful energy projects. It has been difficult to communicate the overall impact individual users are making to a building, and once that is communicated, the question really becomes "Well, what can I do about it?" Historically, individual settings were hardly customizable, spaces were not controllable down to the individual user level, and it was difficult to measure incremental changes in behavior that impact energy use.

Today, we have a wide range of easily deployable and cost-effective technologies that enable us to address these challenges and engage occupants in ways that were impossible before. One means of doing so is through the following three-step process to improve occupant behavior:

1. Empower occupants with data and tools that shed light on their behavior and its impact.
2. Encourage positive behaviors with gamification strategies.
3. Fine tune tools and programs and encourage their continued use.

EMPOWER WITH DATA AND TOOLS

Knowledge is power: Effective sub-metering has allowed us to easily create building-level energy dashboards. This gives the occupants a holistic view of the general health of the building. We have compared overall consumption and savings to the number of vehicle miles driven or average number of trees planted in order to make them more relatable to building occupants. We can now sub-meter down to the floor level and even down to individual occupant level. Whether through
clamp-on current transformer-style connected meters or other readily available, cost-effective sub-metering technologies, we can empower occupants with a clear picture of how much energy they use at a given moment and over the course of the month and year.

A modern BAS serves as the central nervous system of a building, and can easily integrate with IoT-enabled devices, including lighting and daylighting systems, occupancy sensors and electrical distribution systems. It is important to track all of these systems in a central location that is accessible by both building management and occupants.

Effectively designed spaces: We can control our individual light levels, temperatures and ventilation requirements using a modern BAS to refine control to very specific user-defined zones. It is important to plan for this discrete level of controllability throughout the design and construction phases of the building. The design team must be aware of the need for individual occupants or small groups of occupants to control various aspects of their energy usage. Integrated Project Delivery (IPD) methodology has been proven successful in a few recent high performance buildings. This design philosophy brings together ownership, design and construction teams to deliver exceptionally user friendly spaces.

Encourage positive behaviors with gamification strategies: When we have successfully empowered our occupants with knowledge and tools and have their attention, it is important to implement engaging programs to keep their attention and enthusiasm. Creating an atmosphere of friendly competition among individual occupants as well as department or floor level users is key, since it changes the dynamic from "something else I have to do," to encouraging participation. Gamification strategies allow building managers to incentivize all stakeholders to participate, by creating a sense of ownership or the idea that "there's something in it for me."

One large commercial office building in New York City provides a tenant portal to their BAS which, on its main screen, displays that tenant's energy profile in real time and compares it to other tenants in the building. Tenants are incentivized to outperform one another for small scale rewards like catered lunches, gift cards and other prizes, fostering an atmosphere of healthy competition. While the costs of implementing such measures vary, interviews with building managers suggest significant improvements in tenant engagement, and ultimately reduce energy use.

SUGGESTIONS FOR ENGAGING OCCUPANTS

A handful of buildings in New York City that currently engage occupants in this way have used the following specific suggestions to engage occupants on an individual level.

1. Computer monitor: Harvard University's Office of Sustainability suggests that a barely noticeable 30 percent reduction in monitor brightness reduces energy consumption by as much as 20 percent.
2. Individual room light settings: a 20 percent reduction in brightness levels can reduce energy consumption by as much as 40 percent.
3. Raise temperature requirements in individual units: Turning up the thermostat in the summer months, from an average of 72°F to 74°F, alleviates a tremendous amount of cooling load, improving your individual PEI by as much as 30 percent.

A modern BAS serves as the central nervous system of a building, and can easily integrate with IoT-enabled devices.

Measuring, tracking, and regular reporting of the results from these strategies is critical to ensure continued support and success.

Fine tune tools and programs and encourage their continued use: In order to ensure the continued success of these initiatives, it is critical to develop a certain cadence that turns into a routine for occupants and management, and also has enough variety to keep participants interested. When energy-conscious decisions, supported by data and analysis, become part of the daily operating culture of an organization, we will begin to realize great benefits.

As owners, building managers, engineers and vendors, we all share a responsibility to engage the occupants who use and depend on our buildings; it is critical that they are involved and feel a need to lessen the energy burden of their building through a sense of ownership and shared responsibility. If we can save even 10 percent of our daily energy spend through increased occupant engagement, we will make a significant and measurable impact on our nation's energy landscape. This should be an inclusive effort, and today's technology has given us the ability to engage all users of a building easily and cost effectively.

ABOUT THE AUTHOR

Saheel Chandrani *was recently appointed to the NESEA board of directors. While he is a senior account executive at Johnson Controls, Inc., this article reflects his personal interest, to better understand a user's impact on a building. Saheel has built his experience and expertise in HVAC services and products, marketing strategy, and engineering and architectural services, working for companies like Siemens, Cisco, and Neilsoft. He holds a BS in Mechanical Engineering and a BA in Business, both from the New Jersey Institute of Technology. Don't miss Saheel's session, "The Missing Piece: Engaging Tenants in Buildingwide Strategies Toward Efficiency," at the BuildingEnergy NYC Conference + Trade Show, Nov. 3, 2016 at the TKP Center in Manhattan.* MEMBER

ABOUT THE PEER REVIEWER

Susan Mazur-Stommen *is a cultural anthropologist who has researched culture, behavior and sustainability for over 20 years. Her work has included such high points as testifying before Maryland Governor Martin O'Malley. Any given work day might find her: hanging out in a metal fabrication shop in Chicago listening for air pump leaks; taking pictures of people's underwear drawers and asking about laundry pain points in suburban SoCal; eating goat burgers on a farm in rural Alabama; or trying a 'slug' burger at Borroum's, the oldest drugstore in Mississippi.*

LIFE CYCLE ASSESSMENT AT THE SPEED OF DESIGN

BY RODERICK BATES

PEER-REVIEWED BY FRANCES YANG, S.E.

All building materials have an environmental impact backstory. They begin as raw materials that are mined or harvested, processed as feedstocks, transported through complex supply chains and are ultimately manufactured into materials for the purpose of constructing a building. On average, three pounds of resources are consumed to manufacture one pound of material found in a building.[1] For example, manufacturing concrete has impacts ranging from smog to global carbon emissions created through extracting the raw materials, mixing and transporting them to the project site, spraying and/or heating the concrete as it cures, and eventually demolishing and removing the concrete at the end of the building's life. Adding up these impacts, through a process called Life Cycle Assessment or LCA, one kilogram of 3000-psi cast-in-place concrete, over its life cycle, will release into the environment 0.268 kg of carbon, 0.00113 kg sulfur dioxide, 0.0000462 kg of nitrogen, 0.00000000177 kg of CFC-11, 0.0155 kg of ozone, and require the expenditure of 2.2 megajoules of energy.[2]

Life Cycle Assessment is gaining relevance as a factor in measuring the complete environmental impacts of buildings as changes to codes and voluntary certifications like ASHRAE and LEED move the industry toward more energy efficient buildings and reduce the environmental impacts resulting from the use of electricity and thermal energy.[3] New standards, such as the United States Green Building Council's LEED v4, reward designers that use whole-building LCA via materials and resource credits that emphasize environmental impacts throughout a building's life cycle.

Typically, conducting LCAs for buildings and construction has been time and labor intensive, and most LCAs are performed after construction is already complete. The incompatibility of LCA and modeling software led the Philadelphia-based architectural practice KieranTimberlake to develop Tally®, a software tool that combines environmental impact data with material attributes. This tool can use engineering and architectural specifications and assembly details to produce reports designers can use to analyze material selections. These reports provide users with life cycle-based product information by leveraging the same working environment in which building designs are generated. This allows designers to see the impact of their material selections early, while it is still feasible to make changes.

STARTING WITH EMBODIED ENERGY

Throughout its 30-year history, KieranTimberlake has sought to reduce the environmental impact caused by buildings. The firm devotes much of its practice to renovation projects that extend the life of existing buildings. In all of its projects, the firm selects materials carefully, details buildings for longevity, and has even explored novel strategies such as off-site fabrication and design for disassembly.

In 2008, while preparing a submission to the Environmental Protection Agency's Lifecycle Building

Challenge competition, KieranTimberlake wanted to calculate the full magnitude of benefits that could be realized from the material reuse of Loblolly House. This off-site fabricated home was assembled with reversible connections to ease reconfiguration, replacement and reuse of the materials in the future. The design team intuited that this building strategy would offer environmental benefits in the form of reduced embodied carbon, but had yet to quantify the total savings that could be realized from reusing every building element. Loblolly House was modeled three dimensionally with precision using Autodesk® Revit® to facilitate coordination with fabricators and ensure elements assembled off-site would fit together with a high degree of tolerance.

To begin the LCA, a bill of materials was generated from the Revit model; however, granular data such as coatings and adhesives that would allow a full calculation of the building's embodied energy were not included in the model. To fill in the additional information, the team conducting the analysis used a variety of calculation methods, including reviewing component specifications and shipping manifests to determine the type and quantity of materials present in Loblolly House. After establishing these quantities, they sourced the data on the embodied carbon and energy associated with each material from the Granta CES Selector, limiting the scope of impacts to those created during manufacturing. In its search, the team discovered a dearth of information for many typical building materials. Additionally, the calculation process was long, taking more than five weeks for an 1,800-square-foot project.

Despite the slow pace, the team saw the potential for designers to leverage the embodied carbon data for a given material if only it was accessible to them during the design phase. For example, though half of Loblolly House's material impacts were found in the insulation, the home is a summer retreat with one façade that opens fully to catch offshore breezes, meaning very little insulation was actually needed in the home.

If the material impacts had been known to designers during the modeling phase, that portion of the project's environmental impact could have been minimized. But at the time, the pace of assessment did not coincide with the design process. This incongruity, coupled with the scarcity of environmental impact data for materials, underscored the need for a tool that could integrate material impact data into a modeling workflow.

CREATING A LIFE CYCLE ANALYSIS WORKFLOW FOR DESIGNERS

Seeing the value of the Loblolly House analysis, KieranTimberlake began to calculate embodied energy on other projects, ultimately seeking a workflow that provides LCA data to designers in real time. After the firm created a proof-of-concept application called the Real Time Environmental Impact Tool (RTEI), it partnered with Autodesk®, who provided the development team training and support to ensure proper compatibility with Revit® software and access to a variety of opportunities for peer review.

As part of the development process, KieranTimberlake also deepened their understanding of LCA standards by reviewing relevant industry protocols such as ISO 14040 and 14044. To meet industry standards, they needed to use quality-assured data specific to the architectural industry, and also examine impacts from all stages of a building's life cycle: material manufacturing, transportation to site, construction, maintenance and replacement, operations and end of life. Furthermore, it became apparent the limited scope of embodied carbon and energy would need to be expanded to include more impact categories. Given the North American focus of the firm's work, the US EPA TRACI 2.1

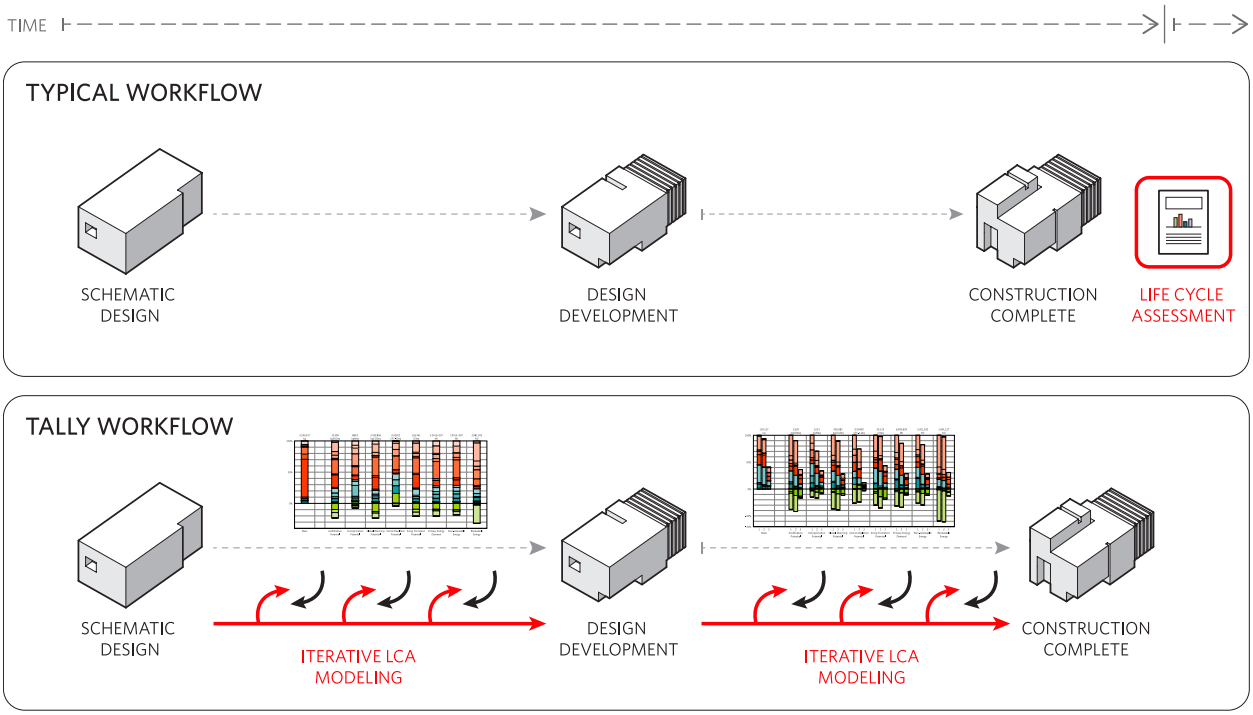


CHART COURTESY OF KIERAN TIMBERLAKE.

categorization scheme was ultimately selected to increase the field of study to include the impact categories of ozone depletion, global warming, acidification, eutrophication and smog formation. To address the LCA data need, the team partnered with thinkstep, the makers of the GaBi LCA database and software, in order to generate a custom, cloud-hosted LCA database that could be easily updated and maintained.

With Tally, KieranTimberlake successfully integrates life-cycle thinking into its design workflows. For example, in the early stages of designing a structural system for the Brown University School of Engineering, KieranTimberlake used Revit® to model two primary structural bay options presented by the structural engineers, one made of steel and one of concrete. The designers then used Tally to analyze the environmental impacts of each of the structural options. This small amount of modeling gave the team actionable LCA data with a quick turnaround time and started a conversation about the importance of reducing cement content in the concrete mix, even in a steel-based structure.

Later in the design process, the team leveraged the design option capability in Revit® to quickly compare two façade assembly options. The analysis revealed that a large proportion of the environmental impact of the façade was in the insulation products. An additional LCA comparison allowed the design team to select an alternative material with a lower impact profile. Using these methods, the team was able to produce a building with the same energy model results, outward appearance and cost, but with a dramatically lower LCA impact. The firm's experience with this project demonstrated the power of utilizing rapid LCA and the importance of understanding material impacts.

Since its commercial release in 2014, Tally has been integrated into the curriculum of more than 50 universities around the world and the design processes of hundreds of architecture and engineering firms. Tally allows architects to move from typologies and "rule of thumb" calculations of environmental impact to real-time assessments at pivotal moments. With the access to LCA data that Tally provides, practitioners and academics can move the profession toward a more inclusive definition of building performance.

Editor's Note: More information on Tally is available at www.choosetally.com.

REFERENCES

1 Wadel, Gerardo. "Sustainability in industrialized architecture: Modular lightweight construction applied to housing" (doctoral thesis, Polytechnic University of Catalonia-Department of Architectural Constructions, 2009). http://hdl.handle.net/10803/6136.

2 *Tally* (Version 2015.08.31), Revit, Philadelphia, PA: KTInnovations, 2015.

3 Al-Fhamdi, S.G., and M.M. Bilec. "Life-Cycle Thinking and the LEED Rating System: Global Perspective on Building Energy Use and Environmental Impacts." *Environmental Science and Technology* 49(7): 4048-4056.

ABOUT THE AUTHOR

Roderick Bates *is an Associate and Senior Researcher, Environmental Management and Commercialization at KieranTimberlake. His work is focused on bringing real-world data in line with the design process. Following an initiative to quantify the embodied energy of buildings–an effort that was recognized in 2008 by the EPA Lifecycle Building Challenge award and a poster presentation in the 2009 ASHRAE Net Zero Energy Building conference, Roderick worked with the research group to develop Tally™, an application for Revit that provides accurate life-cycle data and reporting tools to designers. Roderick interprets ecological, economic, climate, social and site data to inform sustainable building design.*

ABOUT THE PEER REVIEWER

Frances Yang *S.E.*, *is structures and sustainability specialist at Arup. She is a global expert within Arup on LCA-based tools and embodied impacts of construction materials. Frances has more than 10 years of experience in structural engineering design and materials assessment. Amassing skills in life cycle assessment, architecture for the environment, and toxicology, she now solely represents the sustainable materials practice in the Americas region of Arup.*

FROM THEORY TO REALITY: OUR JOURNEY TOWARD SUSTAINABILITY BUILDING A NET ZERO HOME

DOUBLE-WIDE SEAT, RECLAIMED ELM FLOORING.
PHOTO CREDIT: TOM LAMBERT.

BY TOM LAMBERT

Can you really build a net zero energy house based on learnings from an online course? The short answer is yes, and we have CreekSide Net Zero to prove it!

My wife and I are often asked two questions: Why did we build a net zero energy house and how did we know how to build it? The "why" is really an evolution of our values, of "walking the talk." We have always been eco-minded and dreamed of doing something with alternative energy to reduce our carbon footprint. Our first thought was to simply build an energy efficient retirement home without completely understanding what that meant. Being family-focused, we chose property in Pulaski, New York, a few miles down the road from our daughter's family with two energetic grandsons.

As for the "how," after I retired from Xerox in 2013, I spent a lot of time researching green building and high performance houses. I visited informative websites such as Green Building Advisor, Fine Homebuilding and Building Science Corporation. Coming from an engineering background of well-defined design methodologies, I was eager to explore and found it interesting how much discovery is still taking place in the field of building science.

After many hours online and just "one more click," I found the NESEA and HeatSpring sites where I was drawn to information on Marc Rosenbaum's Zero Net Energy Homes course. This was our answer to the "how." What better way to learn than to be guided by a widely-recognized subject matter expert like Marc, who could provide speedy tips and practical knowledge based on actual experience, and to benefit from the lessons learned from others taking the course? Without hesitation, I signed up for this 10-week BuildingEnergy Masters Series course that covered everything from heat loss and energy modeling to solar energy, infiltration and ventilation.

But our dream was bigger than just building a net zero energy house. We also wanted a house

1. BLOWER DOOR TESTING. *PHOTO CREDIT: TOM LAMBERT.*
2. MITSUBISHI MOUNTED HIGHER THAN USUAL TO PROTECT AGAINST DRIFTING SNOW. *PHOTO CREDIT: TOM LAMBERT.*
3. GREAT ROOM, NORTH VIEW. *PHOTO CREDIT: TOM LAMBERT.*
4. 10,260 KW SOLAR ARRAY. *PHOTO CREDIT: NEW ENERGY WORKS.*
5. BLOWER DOOR TEST RESULT AFTER WINDOWS, AIR SEALING AND INSULATION. *PHOTO CREDIT: TOM LAMBERT.*
6. KITCHEN WITH RECLAIMED ELM ISLAND WITH BLACK CHERRY SITE-HARVESTED TOP. *PHOTO CREDIT: NEW ENERGY WORKS.*

that was aesthetically pleasing. My wife, Ann, drew upon her art background and design experience from her current project management role at Wegmans to provide sound creative design direction focused on feng shui principles.

Net zero houses tend to be designed as simple boxes for efficiency reasons. However, it was important to us that our home be built in harmony with the environment and nurture our creative spirit. That's why partnering with New Energy Works Timberframers (NEW), a company that shares our values, seemed like a perfect fit.

We ultimately decided on a hybrid timber frame, which combines traditional stick-building elements with the age-old craft of timber framing. We weren't sure how to make it work, so this was the start of our CreekSide Net Zero House journey.

We went to NEW with requirements and specifications on the envelope and overall design. This included wall and roof construction, site orientation, mechanicals, ventilation, and air sealing concepts. Although NEW was already focused on building energy efficient homes, they had never designed a net zero energy house. Equipped with my engineering background and newly gained knowledge from Marc's class, I felt qualified to provide overall direction throughout the project.

My primary focus was the envelope. One of the most important things I learned in Marc's course is that the envelope design is critical to energy efficiency. Therefore, implementing a robust design with a good air barrier to enable a tight building envelope was key. We had multiple design enclosure meetings with the teams from NEW and Airtight

THE DETAILS

- 2,853 ft², newly constructed hybrid timberframe home
- Completed in summer 2016
- Douglas fir timber frame
- Site-harvested Black Cherry and White Oak used for interior millwork
- Reclaimed elm wood floors and cabinetry
- 10,260 watt ground-mount solar array consisting of 36 SolarWorld 285 mono panels with Enphase M250 microinverters
- Projected PV production of 12,702 kWh/yr
- Air infiltration rate of 0.28 ACH50 (53 percent lower than Passive House Institute US target)
- Inline Fiberglass triple pane windows (U = 0.15 to 0.17)
- Mitsubishi multi-zone ducted and ductless air-source heat pump
- Zehnder ComfoAir 350 energy recovery ventilator (ERV)
- Subslab - 4-inch Expanded Polystyrene Insulation (EPS) (R-16), Foundation walls – 2-inch EPS and 4-inch Roxul (R-24 total)
- Pre-panelized 12-inch double-stud walls, 24-inch on center, with a continuous layer of INTELLO Plus variable vapor membrane on outside surface of inside wall, dense-packed cellulose (R-40)
- Pre-panelized 18-inch I-beam roof, dense-packed cellulose (R-60)
- Euroshield EuroLite® Slate rubber roofing (up to 95 percent recycled content from tires)
- eGauge energy meter system
- Whirlpool Heat Pump dryer
- GE GeoSpring™ Heat Pump Water Heater
- Haiku H Series Ceiling Fan
- SportsArt exercise elliptical with a micro-inverter to put electricity back into the grid

To help minimize our carbon footprint we were mindful about our material selection.

Services, Inc., both experts in Passive House consulting, to collaborate on the implementation details for the envelope design. Throughout the design process, I utilized and updated Marc's Zero Net Energy Model calculator to better understand the energy impacts of any design changes we made.

DESIGN CONCEPT SKETCH

One of the concerns with double wall construction is the risk of condensation building up and increasing the moisture content on the inside of the exterior sheathing. To address this concern, the Airtight Services team recommended that we modify the design to include a continuous vapor retarder membrane called INTELLO Plus on the outside surface of the inside wall.

I supplemented my learnings from Marc's course with HERS rater training at Performance Systems Development (PSD) in Ithaca, New York. Using new skills gained from this training, I did a blower door test for our home. After installing windows and cellulose insulation and air sealing our home, we achieved an infiltration rate of 0.28 ACH50, which is 53 percent lower than the Passive House Institute US target. Needless to say, this rating impressed our Passive House friends from Airtight Services.

To help minimize our carbon footprint we were mindful about our material selection. We used LED lighting throughout the house, rubber roofing made from recycled tires, and harvested black cherry and white oak from our site for various counters, cabinets and benches in our house. We also used reclaimed wood purchased from Pioneer Millworks, NEW's sister company, for other millwork including beautiful elm flooring, single-track, mixed hardwood "barn" doors and an accent wall. We tried to select low-maintenance materials to facilitate aging in place in our home.

We hope that our project inspires others to see the possibility of building their own net zero energy home or that it at least provides others with ideas for how to be more energy efficient and sustainable. I know that the skills I learned from Marc's course, coupled with our passion to build a house with a soul, has allowed us to walk the talk and build our dream - our CreekSide Net Zero home.

ABOUT THE AUTHOR

Tom Lambert *retired from Xerox in 2013 after 32 years in numerous roles, ultimately serving as manager of the worldwide launch organization and responsible for the introduction and delivery of new products. He has reinvented himself as owner of CreekSide Energy Solutions, a company he started to provide residential energy modeling and consulting services. Tom is a certified HERS rater and Energy Star Builder and currently consults with NEW as a program manager.* MEMBER

SOLAR POLICY IN THE NORTHEAST: WHAT'S NEW, WHAT'S NEXT?

BY KARL R. RÁBAGO AND MIKE TRAHAN

The Northeast Solar Energy Market Coalition (NESEMC or the Coalition) was established in December 2014 with support from the United States Department of Energy (US DOE) SunShot Initiative's Solar Market Pathways program. NESEMC works to advance solar market development and solar deployment in the Northeast by advancing solar market policy through the efforts of a coalition of solar business associations in the region.

The Coalition is managed through the Pace Energy and Climate Center. Its membership includes Solar Connecticut, the Mid-Atlantic Solar Energy Industries Association (MSEIA), the Solar Energy Business Association of New England (SEBANE) and the New York Solar Energy Industries Association (NYSEIA). NESEMC has decided to focus its policy efforts on four key issues: green banking, interconnection, permitting, and value of solar. The coalition aims to break down silos and share information, embracing the core premise that no one state solar industry in the Northeast can survive unless we do better as a region.

SOLAR POLICY ISSUES FOR THE NORTHEAST

GREEN BANKING: NESEMC is working with top researchers and advocates of green banks in the U.S. to gather the data necessary to prove the need for additional state-level green banks in the Northeast. State-funded green banks are expanding the solar market in many markets across the country.

To substantiate the benefit of forming additional state green banks in the Northeast, NESEMC is working closely with the Coalition for Green Capital and the Union of Concerned Scientists (UCS). The Connecticut Green Bank was brought on a NESEMC partner. Discussions are ongoing with UCS on whether a model UCS used to prove green bank viability in several states can be run in Northeast states where ratepayer-funded incentives are being challenged, are in decline or are non-existent.

VALUE OF SOLAR: In the Northeast, only Maine solar advocates have been successful in setting a Value of Solar (VOS) through a state-sanctioned process. In Maine, VOS has been revealed to be as high as $0.33/kWh, when all known and measurable costs and benefits are counted. SEBANE Coalition members in Massachusetts and other states are pushing for VOS analysis. In New York, the "Value of Distributed Energy Resources" process is addressing VOS in the context of the larger "Reforming the Energy Vision" process laid out by Governor Andrew M. Cuomo, offering promise of additional momentum for full and fair solar valuation. The Rhode Island Public Utilities Commission has launched Docket 4600, an inquiry in the utility-of-the-future issues, and which calls for a cost-benefit analysis to help guide review of utility rate structure in future proceedings.

Value seems to be the significant solar market policy issue for NESEMC states, where net metering caps are common. For this reason, Coalition staff have prepared and shared a series of documents specifically for Coalition members' use in helping to educate decision makers in their states on the VOS issue. The pieces, available at the NESEMC website, www.nesemc.com, include:

- Achieving very high PV penetration: The need for an effective electricity remuneration framework and a central role for grid operators
- How to Assess the True Value of Solar
- Value of Solar Study Design Elements
- Value of Solar Tariff Pilot Design Elements
- Presentation - Understanding the Value of Renewable Energy

NESEMC's role is to build a clean energy, environmental and economic development case for why states should consider VOS analysis. One recent case study demonstrates the "value" of VOS analysis. In early 2016, the Connecticut General Assembly's nonpartisan Office of Fiscal Analysis (OFA) analyzed a community solar bill and determined the bill would create costs for the state. A Connecticut legislator arranged a meeting of Coalition co-directors with the OFA who wrote the bill analysis. Once the Coalition introduced the benefits addressed in VOS analysis, the OFA staffer amended the analysis, effectively neutralizing the adverse tone of the fiscal note. The community solar bill was later signed into law.

INTERCONNECTION: The interconnection process–which involves technical and engineering procedures associated with connecting solar generators to the grid–has slowed the growth of solar in the Northeast, and is therefore a soft cost worth targeting.

NESEMC plans to advise solar leaders on how to create their own interconnection working group, and has started the process in Connecticut. The long-term goal is to develop a *regional* interconnection working group that would facilitate the sharing of harmonious interconnection best practices between states.

The Coalition is seeking additional support from the SunShot Initiative in the form of technical assistance to create a side-by-side comparison of interconnection policies and processes, and to identify gaps and opportunities for increasing process coherence.

PERMITTING: The American PV industry has had a hard time driving down the soft cost of permitting solar. Solar installers favor a quick and simple process for permitting basic "cookie-cutter" solar systems, typically up to 15kW in size.

Local building officials, sometimes referred to as "authorities having jurisdiction," often push back with stringent requirements and procedures reflecting low levels of familiarity with solar products and installation methods. This slows the process and increases costs of solar deployment.

SEIA ranks Massachusetts, New Jersey, New York and Vermont in or near the top 10 U.S. states in terms of solar jobs and installed solar capacity (2015). California, home to America's most comprehensive, streamlined permit law, leads the way on solar capacity per capita, which is the key indicator in this discussion; no state in the Northeast measures up. New Jersey comes closest with just over half as much capacity per capita as California. Vermont's solar capacity per capita is just under half that in California. The Coalition's goal is to address solar permitting in order to enable the Northeast solar market to develop from its relatively low level of development into a high-penetration market much more efficiently and rapidly.

HOW TO FIND MORE INFORMATION

Value seems to be the significant solar market policy issue for NESEMC states, where net metering caps are common. For this reason, Coalition staff have prepared and shared a series of documents specifically for Coalition members' use in helping to educate decision makers in their states on the VOS issue. The pieces, available at the NESEMC website, nesemc.com, include:

- **Achieving very high PV penetration: The need for an effective electricity remuneration framework and a central role for grid operators**
- **How to Assess the True Value of Solar**
- **Value of Solar Study Design Elements**
- **Value of Solar Tariff Pilot Design Elements**
- **Presentation - Understanding the Value of Renewable Energy**

CONCLUSION

After just 18 months, NESEMC has embarked on an ambitious agenda of harmonizing solar market policy in the Northeast. The potential upsides are huge: a cleaner environment, climate responsibility, a strong local energy industry and a coherent market with scale and scope equivalent to the best in the world.

The Coalition has prioritized the issues of VOS, interconnection, green banking and permitting because of the powerful role these issues play in market size and growth. The Coalition philosophy is as simple as it is powerful. If solar businesses in the nine northeastern states can harmonize and prioritize their issues first, they can become more effective leaders for solar policy region-wide. The Northeast is already a hotbed of solar policy change and development. The need for a coordinated voice—the voice of the Northeast Solar Energy Market Coalition—has never been greater.

ABOUT THE AUTHORS

Karl R. Rábago *is the executive director of the Pace Energy and Climate Center, at the Pace University School of Law in White Plains, New York, where he also serves as co-director of NESEMC.*

Mike Trahan *is executive director of Solar Connecticut, and co-director of the NESEMC.*

2016 DIRECTORY

BUILDINGENERGY GREEN PAGES

The premier resource for locating sustainability professionals in the Northeast and beyond.

Want your business to be listed in next year's BuildingEnergy Green Pages?
Become a NESEA business member today!

For more information, visit:
nesea.org/join

BUILDINGENERGY GREEN PAGES

By State

C

California
Apricus USA, Inc.
Delta Products Corporation
Siga Cover, Inc.

Connecticut
A&B Cooling
A.W. Hastings & Company
Appropriate Designs
BPC Green Builders, Inc.
CED Greentech East
Celebration Green Design & Build
Celtic Energy, Inc.
Centerbrook Architects and Planners, LLP
Connecticut Green Bank
George Penniman Architects, LLC
Home Energy Technologies
Neighborhood Housing Services of New Haven, Inc.
Partners For Architecture, Inc.
Peterson Engineering Group
R.J. Aley, LLC
Sellars Lathrop Architects, LLC
Trillium Architects, LLC
United Illuminating Company
Venbrook Insurance Services
Weedon Design Build
Wesson Energy, Inc.
Wolfworks, Inc.

M

Maine
Benjamin & Company, Inc.
Briburn
Dominic Paul Mercadante Architecture
Emerald Builders
Kaplan Thompson Architects
Kolbert Building
Lassel Architects PA
Net Zero Builders
North By East Building Company
passivhausMAINE
Performance Building Supply
Rachel Conly Design, LLC
Resilience Hub
Richard Renner | Architects
Sparhawk Group
Taggart Construction, Inc.
Thompson Johnson Woodworks
Thornton Tomasetti, Inc.

Maryland
Urban Grid

Massachusetts
377 Builders
A3 Architects, Inc.
Aegis Energy Services
altE Store, Inc.
Amy Munsat Design
Andelman and Lelek Engineering, Inc.
Aspen Environmental, LLC
Auburndale Builders
Austin Design, Inc.
B Kim Erslev, Architecture and Landscape Design
Bales Energy Associates
Basnett Design/Build/Remodel
BCK Law, P.C.
Benjamin Nutter Architects, LLC
Berkshire Photovoltaic Services (BPVS)
Beyond Green Construction
BlueSel Home Solar, Inc.
Brissette Electric, Inc.
Brown Lindquist Fenuccio & Raber Architects, Inc.
Building Shelter, Inc.
Byggmeister, Inc.
c&h architects
Casaceli Construction, LLC
Catchlight, Inc.
Center For Ecotechnology (CET)
Center For Sustainable Energy
Central Home Energy Experts
City of Cambridge, Environmental and Transportation Planning Division
Clark & Green Architects
CLEAResult
CMF Engineering, Inc.
Coastal Windows & Exteriors, Inc.
Conservation Solutions Corporation
Cotuit Solar, LLC
Deap Energy Group, LLC
Decumanus Green Design/Build, Inc.
Demand Management Institute, Inc. (DMI)
Dietz & Company Architects, Inc.
Donnell Carpentry
E2 Solar, Inc.
Embue
Energy Federation, Inc. (EFI)
Energy Hound
European Architectural Supply (EAS)
EvB Design
Farley Built, Inc.
Foam USA, LLC
Fred Davis Corporation
Geoffrey Richon Company, Inc.
Godfrey Design-Build
The Green Engineer, Inc.
Hampshire Council of Governments
Hancock Software, Inc.
Hands-On Construction
Hardwick Post & Beam
Independence Solar
Infrared Diagnostic, LLC
Integrata Architecture + Construction
Integrated Eco Strategy
Jack Miller Contractors, Inc.
Jim Muka, Window Sales
John Fülöp Associates, Architects and Planners
Jones Whitsett Architects, Inc.
Kent Hicks Construction Company
Kraus Fitch Architects, Inc.
Landmark Services, Inc.
M.G. Kane Properties, Inc.
M.J. Moran, Inc.
Maple Hill Architects
Maryann Thompson Architects
Massachusetts Audubon Society
Massachusetts Clean Energy Center (MassCEC)
McCauley Lyman, LLC
Menck Windows
Mitsubishi Electric Heating & Cooling
National Grid
New Ecology, Inc.
Next Phase Studios, Inc.
Noble Home, LLC
Northeast Sustainable Energy Association (NESEA)
October Engineering, LLC
Pavers By Ideal
Pella Windows and Doors
Placetailor, Inc.
Preservation of Affordable Housing (POAH)
Project Planning and Management
PV Squared
Quigley Builders, Inc.
r3construction, Inc.
Ra Solar Company
Reinsulation, Inc.
Rodman CPAs
RST Thermal
Sage Builders, LLC
Sandri Energy, LLC
Seed Systems
Simpson, Gumpertz & Heger, Inc.
SJP Environmental Consulting, LLC
Solablock
Solar Store of Greenfield
Solar Wave Energy, Inc.
Solect Energy Development
South Mountain Company
Spartan Solar
Spirit Solar
Steveworks, LLC
Stiebel Eltron, Inc.
SunBug Solar
Sustainable Comfort, Inc.
Sustainable Energy Analytics
SWZ Architects, LLC
Thinklite, LLC
Thoughtforms Corporation
Timeless Architecture
Total Green Energy Solution, LLC
Turn Key Builders, Inc.
Uncarved Block, Inc.
Urban Habitat Initiatives
Valle Group
Valley Home Improvement
Wagner Development
Warren Design Build
WegoWise, Inc.
Wright Builders, Inc.
Yaro Windows + Doors
ZeroEnergy Design

N

New Hampshire
Antioch University of New England (AUNE)
Bensonwood
Bruss Project Management
Foard Panel, Inc.
Futuro, Inc.
Garland Mill Timberframes
Jordan Institute, Inc. and Resilient Buildings Group
Little Green Homes
Mason Library, Keene State College
Mulberry Tree Builders, LLC
Petersen Engineering, Inc.
R. L. Benton - Builder
RH Irving Homebuilders
Ridgeview Construction
Smart Energy of New England, Inc.
Walker Cellar Works
Water Energy Distributors
Yankee Thermal Imaging
Zehnder America, Inc.
SPL Development Group

New Jersey
CircuitMeter, Inc.
Heat-Timer Corporation
RLE Industries
Steele Kellogg AIA

New York
475 High Performance Building Supply
Air Barrier Solutions, Inc.
Alfandre Architecture, PC
Anthony J Musso Architect
Apex Energy Analysis
Atelier Ten, LLC
Baukraft Engineering
Black Mountain Design Build
Blue Sea Development Company, LLC
BuildingLogic, Inc.
Caliper Studio
Community Preservation Corporation (CPC)
Consolidated Edison Company of New York, Inc. (Con Ed)
Crown Heights Jewish Community Council, Inc.
David Murray Architect
eco_logic STUDIO, architecture & engineering, PLLC
Emerald Advisors & Consultants, Inc.
Energy Investment Systems
Gotham 360
Healthy Home Energy & Consulting, Inc.
Hudson River Design
Hudson Valley Community College
Integral Building & Design, Inc.
Klepper, Hahn & Hyatt
KOW Building Consultants
New Energy Works
Timberframers & Pioneer Millworks
Northern Manhattan Improvement Corporation (NMIC)
Ridgewood Bushwick Senior Citizens Council (RBSCC)
Steven Winter Associates, Inc.
Yardi/Enerliance
Enterprise Community Partners, Inc.
USL Technology, Inc.

O

Ohio
RBI Solar, Inc.

Ontario
Cornerstone Architecture
Cosella-Dörken Products, Inc.

P

Pennsylvania
Bakker & Lewis Architects
Energy Opportunities, Inc.
H2O Degree-Global Water & Energy Solutions
In Posse
Navitus Strategies
Sustainable Business Network

R

Rhode Island
DeMetrick Housewrights
Dryvit Systems, Inc.
Heartwood Group, Inc.
Kelly Taylor Interior Design
Rhode Island Commerce Corporation
Stephen Turner, Inc.
Truth Box, Inc.
Viessmann Manufacturing Company, Inc. (US)

S

South Dakota
InSoFast, LLC

V

Vermont
Allied Building Contractors, LLC
Bontrager Custom Builders, Inc.
BuildingGreen, Inc.
Cushman Design Group, Inc.
Energy Futures Group
Green Mountain College / Griswold Library
HELM Construction Solutions
Integrated Solar Applications Corporation
Lewis Creek Builders
Maclay Architects
Mindel and Morse Builders, LLC
New Frameworks Natural Building, LLC
Pill-Maharam Architects
TimberHomes Vermont
West Hill Energy And Computing
Yestermorrow Design/Build School

W

Washington
Retrotec, Inc.

Listings are current as of June 30, 2016.

# #

377 Builders
P.O. Box 483
Housatonic, Massachusetts 01236
413-429-6075
office@377builders.com
http://www.377builders.com
We are a member-owned general contracting company based in the Berkshires of Western Massachusetts. Our expertise is in residential and light commercial construction, including additions and full-scale renovations for your home or building. We also specialize in custom cabinetry and sustainable practices. As a tech-savvy group we use web-based project management tools that make collaboration an easy and enjoyable experience. We'll present you with the best options to suit your vision and resources whether innovative, traditional, or a blend of both.
Specialties: *Building Design & Construction*

475 High Performance Building Supply
334 Douglass St.
Brooklyn, New York 11217
800-995-6329
ken@foursevenfive.com
http://www.foursevenfive.com
475 High Performance Building Supply (475) provides essential building knowledge and components to building professionals. 475 helps make more durable, resilient, ecological, and energy-efficient buildings that optimize occupant comfort and health. We enable the building improvements required to dramatically reduce our energy demand and address our climate crisis. We are an ecommerce-based catalyst in the transformation of US construction to high-performance, low-energy and Passive House buildings. The name "475" is a reference to the heat demand requirement of the Passive House Standard, 4.75 kilo BTUs per square foot per year. Passive House is the gold standard for high performance construction today.
Specialties: *Envelope & Enclosure, Insulation, Manufacturing, Passive Housing, Windows*

A

A&B Cooling
PO Box 1356, 660 Nutmeg Rd. North
South Windsor, Connecticut 06074
860-528-4436
guy@abcoolingandheating.com
http://www.abcoolingandheating.com
Geothermal specialists since 1995, LEED Gold and Silver designer and installer, custom fabricated duct systems, radiant floor systems, heat and energy recovery ventilation systems.
Specialties: *Geothermal, HVAC, Indoor Air Quality, Mechanical Systems & Lighting*

A.W. Hastings & Company
2 Pearson Way
Enfield, Connecticut 06082
800-966-2784
shoyt@awhastings.com
http://www.awhastings.com
As a leading distributor for Marvin Windows & Doors, A.W. Hastings & Company partners with its retailer network to bring their customers' vision to life throughout the northeast. Made in the USA and sold and serviced locally, Marvin products are manufactured with sustainability in mind, starting with design and continuing through the entire life cycle of every project, always with an emphasis on long-term durability, efficiency and quality. Whether your project is passive house, Net Zero, or a home that simply uses elements of sustainable design, the Marvin Family of Brands provides solutions you need - including dual pane and tri-pane options yielding total window U-Factor values as low as .15.
Specialties: *Windows*

A3 Architects, Inc.
831 Main St.
Dennis, Massachusetts 02638
774-487-0547
alison@a3architectsinc.com
http://www.a3architectsinc.com
A full service architectural firm specializing in environmentally responsible design for commercial and residential projects throughout Cape Cod, Islands and South Coast. We offer net-energy zero design including Passive House certification and specialize in coordinating with various renewable energy systems.
Specialties: *Architecture, Energy Conservation, Insulation*

Aegis Energy Services
55 Jackson St.
Holyoke, Massachusetts 01040
413-536-1156
mcummings@aegisenergyservices.com
http://www.aegisenergyservices.com
Aegis Energy Services is an innovative, full service Combined Heat and Power (CHP) company based in Holyoke, MA. Founded in 1985, Aegis Energy Services' modular systems are currently utilized across the Northeast and Mid-Atlantic providing sustainable, clean power options for a wide array of customers. Aegis assists a variety of facilities in reducing both energy costs and emissions, from healthcare and assisted living facilities, to recreational and multi-unit residential complexes, and hotels. There are also institutional, educational, and industrial facility applications.
Specialties: *Alternative Energy, Energy Conservation, Manufacturing*

Air Barrier Solutions, Inc.
257 Middle Rd.
Crown Point, New York 12928
877-226-2641
lharmon@airbarriersolutions.com
http://www.airbarriersolutions.com
We provide air barrier and insulation inspection/audit services, including bulk foam installation, across the U.S. and Canada. All of our projects begin with a state-of-the-art diagnostic evaluation. Customized retrofit plans are developed for each building. The scope of the work is implemented by Air Barrier Solution's own crews and project managers, using proprietary, quality assurance, and measurement verification methodologies.
Specialties: *Consultancy, Energy Auditing, Insulation*

Alfandre Architecture, PC
231 Main St.
New Paltz, New York 12561
845-255-4774
info@alfandre.com
http://www.alfandre.com
Alfandre Architecture specializes in the design of energy, resource-efficient, healthy buildings.
Specialties: *Architecture, Design Process*

Allied Building Contractors, LLC
1234 West Hill Rd.
Roxbury, Vermont 05669
802-485-9563
info@alliedbuildingvt.com
http://www.alliedbuildingvt.com
Allied Building Contractors is a unique design/build general contracting firm in Central Vermont that has a focus on both the quality of the end result and the client's experience throughout the entire process of the project.
Specialties: *Building Design & Construction, Construction Process*

altE Store, Inc.
330 Codman Hill Rd.
Boxborough, Massachusetts 01719
877-878-4060
sascha.deri@altestore.com
http://www.altestore.com
Founded in 1999, altE has catered to customers on every continent of the globe. A 2006 Inc. 500 awarded company, altE aims to continue to fulfill its motto, Making Renewable Do-able, by offering cost competitive and high-quality renewable energy related products to Solar Installers and Do-It-Yourselfers.
Specialties: *Photovoltaics, Solar Thermal, Wind*

Amy Munsat Design
Cambridge, Massachusetts 02138
617-576-2893
amunsatdesign@gmail.com
Specialties: *Architecture, Design Process*

Andelman and Lelek Engineering, Inc.
1408 Providence Hwy., Ste. 334
Norwood, Massachusetts 02062
781-769-8773
mike@andelmanlelek.com
http://www.andelmanlelek.com
Andelman and Lelek Engineering, Inc. is an engineering consulting and design firm specializing in building energy modeling, energy efficiency consulting, commissioning services, design of energy efficient HVAC systems, and facilities planning and sustainable building development as related to mechanical systems.
We have provided energy modeling and analysis services to utility companies, architects, engineers, and building owners since 2002. Our staff of nine includes six mechanical engineers and one electrical engineer. The two principals have over forty-five years of energy modeling experience.
Specialties: *Energy Auditing, Energy Conservation, Engineering*

Anthony J Musso Architect
504 Harbor Rd.
Cold Spring Harbor, New York 11724
631-367-8626
ajmarchitect@gmail.com
http://ajmarchitect.com
An architectural firm practicing sustainable architecture, interior architecture, landscape design and Passive House design. "The architecture for today, respects the past; while solving our contemporary needs in a responsible sensible design."
Specialties: *Architecture, Building Design & Construction, Design Process, Landscape Design, Lighting Design, Multifamily, Net Zero Energy, Passive Housing, Single Family*

Antioch University of New England (AUNE)
40 Avon St.
Keene, New Hampshire 03431
603-357-3122
stickner@antioch.edu
http://www.antiochne.edu/nesea-16
Antioch University New England (AUNE) offers a transformative education for passionate students who want to make a difference in the world and create lasting change. AUNE's MBA in Sustainability program focuses on how sustainable practices are implemented in operations, human resources, finance, marketing, and strategic planning in organizations. Competency in sustainability methods, systems thinking, leadership, and collaboration is developed across our integrated curriculum throughout the 36-credit, 2-year weekend program. AUNE also offers the 12-month Sustainable Business Certificate, a credited certificate for people interested in integrating sustainability practices into their businesses and nonprofits.
Specialties: *Commercial & Institutional, Education*

Apex Energy Analysis
58 Balfour Dr.
Wappingers Falls, New York 12590
914-202-0616
k.ashcraft@apexenergyanalysis.com
http://www.apexenergyanalysis.com
Most businesses know how much they are spending on energy. However, many do not know why their costs run high, or if their building is energy efficient. Benchmarking is the most effective method to measure the efficiency of a building's energy performance. It compares a building's energy performance against that of similar buildings. By looking at your building's energy consumption according to industry-standard energy metrics, Apex Energy Analysis can assess energy performance and identify potential areas for improvement.
- *Compare building performance to neighbors and similar buildings*
- *Monitor consumption peaks and valleys over time*
- *Identify energy systems needing attention*
- *Discover opportunities for efficiency improvements*
- *Track actual savings for improvement projects*

Specialties: *Consumer Information, Energy Auditing, Energy Conservation*

Appropriate Designs
9 Bates Rd.
Chaplin, Connecticut 06235
860-455-2000
app.designs@yahoo.com
http://www.appropriatedesigns.net
Green design and construction management services in with consistent client involvement. Collaboration with other design professionals and contractors, energy modeling, appropriate siting and scaling, interior zoning of spaces, coherent vertical and horizontal circulation, universal design, daylighting, energy efficient envelopes, value engineering and optional project phasing are hallmarks of our approach. Experienced in DER, earth sheltered residences and green roofs.

Firm believer in design/build approach as tool to refine design and promote integrity of construction.
Specialties: *Building Design & Construction, Energy Conservation, Insulation, Remodeling/DER*

Apricus USA, Inc.
6060 West Manchester Ave., Ste. 109
Los Angeles, California 90045
877-458-2634
inquiry-usa@apricus.com
http://www.apricus.com
Apricus is a leading designer and manufacturer of solar hydronic heating and cooling products.

Founded in 2003 by Australian Mick Humphreys with a specific focus on solar thermal solutions, Apricus has since grown into a global company with distribution and support offices worldwide.
Specialties: *Alternative Energy, Design Process, Engineering, HVAC, Manufacturing, Multifamily, Solar Thermal*

Aspen Environmental, LLC
270 Lawrence St.
Methuen, Massachusetts 01844
978-681-5023
info@aspenenvironmentalservices.com
http://aspenenvironmentalservices.com
Aspen Environmental is the Premier Company for Mold Remediation in Massachusetts, New Hampshire, Greater Boston, and New England.
We have the professional certifications and experience not only for cleaning mold and removing mold that you may have, but for taking the corrective measures to ensure it won't happen again. Most companies are not certified in toxic mold removal. All they do is a "cleaning." This usually does not kill mold spores, and they grow back in a short time.
We follow the strict standards of NORMI (National Organization of Remediators and Mold Inspectors) and the IICRC (Institute of Inspection, Cleaning, and Restoration Certification).
Specialties: *Indoor Air Quality*

Atelier Ten, LLC
45 East 20th St., 4th Fl.
New York, New York 10003
212-254-4500
newyork@atelierten.com
http://www.atelierten.com
As environmental design consultants and building services engineers we are committed to high-performance and sustainable design within the built environment.
Our core objective is to meet the needs of our clients by developing well-integrated buildings with simple systems that work with natural laws of physics to increase well being, reduce energy consumption and contribute back to the greater environment.
Specialties: *Commercial & Institutional, Consultancy, Engineering, Lighting Design, Mechanical Systems & Lighting, Multifamily, Single Family*

Auburndale Builders
305 Auburn St.
Newton, Massachusetts 02466
617-467-4171
vision@auburndalebuilders.com
http://www.auburndalebuilders.com
We are passionate about high-performance homes: new construction, renovation, Passive and Net-Zero. Our team knows the integrated process necessary for a truly high-performance home and works with the right experts to ensure excellent results. We believe in making the process as good as the product to enhance the lives of those who live there.
Specialties: *Alternative Energy, Beyond Energy, Building Design & Construction, Energy Conservation, Indoor Air Quality, Insulation, Net Zero Energy, Passive Housing, Remodeling/DER*

Austin Design, Inc.
16 Call Rd.
Colrain, Massachusetts 01340
413-624-9669
office@austindesign.biz
http://www.austindesign.biz
Austin Design, Inc. provides architectural design services for homes, businesses and communities. We advocate a team approach between client, builder, and architect that encourages the sharing of expertise and a passion for good design.
Specialties: *Building Design & Construction, Landscape Design, Architecture*

B

B Kim Erslev, Architecture and Landscape Design
16 Wilde Rd.
Shelburne Falls, Massachusetts 01370
413-625-2164
kim.erslev@gmail.com
We are an ecologically-based architecture and landscape design firm that works closely with clients to create designs that connect our homes and communities to the power and beauty of the natural world.
Specialties: *Alternative Energy, Architecture, Beyond Energy, Composting, Design Process, Envelope & Enclosure, Insulation, Landscape Design, Multifamily, Net Zero Energy, Passive Housing, Remodeling/DER, Single Family, Solar Thermal*

Bakker & Lewis Architects
243 Jackson Rd.
Shavertown, Pennsylvania 18708
570-675-8843
rob@bakker-lewis.com
http://www.bakker-lewis.com
We are a small architectural firm specializing in designing new and retrofitting existing buildings which are both responsive to individual needs and that contribute to a greener environment.
Specialties: *Architecture, Building Design & Construction, Commercial & Institutional, Energy Conservation, Remodeling/DER, Single Family*

Bales Energy Associates
50 Miles St.
Greenfield, Massachusetts 01301
413-863-5020
bart.bales@balesenergy.com
http://www.balesenergy.com
Bales Energy Associates provides whole building energy analyses; high-performance mechanical design; and solar energy & wind energy systems analysis & design services.
Specialties: *Building Design & Construction, Cities & Communities, Commercial & Institutional, Consultancy, Consumer Information, Energy Auditing, Photovoltaics*

Basnett Design/Build/Remodel
14 Gilson Rd.
Littleton, Massachusetts 01460
978-952-2552
jim@basnettdbr.com
http://www.basnettdbr.com
Full service residential remodeling company with extensive experience in all phases of residential construction. We are passionate about energy efficiency, durability, low maintenance, and indoor air quality and bring that passion to every job that includes repair or modification to the building envelope and/or mechanical systems.
Specialties: *Building Design & Construction, Remodeling/DER*

Baukraft Engineering
306 Lafayette Pl.
Peekskill, New York 10566
347-674-4287
cramer@baukraft.com
http://www.baukraft.com
Baukraft Engineering provides design and consulting services for high-performance buildings in the residential and small commercial market, focusing on HVAC systems and enclosure design & detailing for both new construction and renovation projects. Certified (CPHC) Passive House Consultant and Professional Engineer (PE) on staff.
Specialties: *Building Design & Construction, Consultancy, Engineering, HVAC, Passive Housing*

BCK Law, P.C.
271 Waverley Oaks Rd., Ste. 203
Waltham, Massachusetts 02452
617-244-9500
bckboston@bck.com
http://www.bck.com
BCK Law, P.C. is a firm concentrating in transactional, regulatory and corporate law. While the firm practices in many different fields, we place a special emphasis on energy, environmental/land use, construction, employment, new media and commercial law and arbitration/mediation services. Our clients include businesses of every size (including entrepreneurial and technology start-ups); cities, towns, counties, regional compacts and state governments; environmental and other non-profit organizations and individuals. Firm attorneys are admitted to practice before all Massachusetts state and federal courts, as well as state and federal courts in Idaho, New York, Vermont, Washington, D.C., and the U.S. Court of Appeals in the Fifth and Sixth Circuits.
Specialties: *Money & Business*

Benjamin & Company, Inc.
136 Maine St. #5
Brunswick, Maine 04011
207-729-7171
ben@benjamin-co.com
http://www.benjamin-co.com
Benjamin & Company builds on a rich history of fine Maine craftsmanship to create timeless spaces that are at once authentic and innovative, traditional and cutting-edge. We care deeply about what we build and how we build it, and strive to leave our clients with beautiful, comfortable, and functional spaces that will be cherished for generations to come.
With decades of combined expertise in hand-cut timber frames, advanced green building techniques, custom design and drafting, and efficient project management, we are proud to offer boutique frame-to-finish services to clients in Mid-Coast Maine and beyond.
From traditional mortise and tenon timber frame barns, to Net Zero Energy custom homes, Benjamin & Company can work with you to bring your dreams to life.
Specialties: *Building Design & Construction, Net Zero Energy, Single Family*

Benjamin Nutter Architects, LLC
PO Box 254, 43 Canterbury Hill Rd.
Topsfield, Massachusetts 01983
978-887-9836
info@benjaminnutter.com
http://www.benjaminnutter.com
In the past 30 plus years, Benjamin Nutter Architects has transformed over 400 homes and landscapes in New England. As Principal Architect, Ben Nutter works closely with his talented team of architects and designers providing even more expertise to a project. A team approach allows every detail to receive the careful attention it deserves, right down to the color of a light switch! Each member of the Benjamin Nutter Architects team has one goal in mind, to provide each client with their dream home.
Specialties: *Architecture, Single Family*

Bensonwood
6 Blackjack Xing.
Walpole, New Hampshire 03608
877-203-3562
info@bensonwood.com
http://bensonwood.com
Bensonwood is acknowledged as a premier designer-builder of energy-efficient timber frame, hybrid and other high-performance homes, and commercial buildings. Our mission is to find better ways to build, while consistently improving people's lives.
Bensonwood is also deeply engaged in bringing a vision of sustainability to the future of housing. We understand that the housing industry must change so it is both responsive to the consumer and responsible to the earth. To create a sustainable society one must build sustainable homes – with approaches to home building that link beauty, craft, ecology, wise resource use, simplicity, and elegance.
Specialties: *Building Design & Construction, Design Process*

Berkshire Photovoltaic Services (BPVS)
46 Howland Ave., Ste. 3
Adams, Massachusetts 01220
413-743-0152
info@bpvs.com
http://www.bpvs.com
Since 1985, the highest quality design and installation of efficient and durable photovoltaic systems for residential, commercial & institutional customers.
Specialties: *Alternative Energy, Beyond Energy, Building Design & Construction, Certifications & Standards, Cities & Communities, Commercial & Institutional, Construction Process, Consultancy, Consumer Information, Design Process, Education, Energy Auditing, Energy Conservation, Engineering, Envelope & Enclosure, Home Inspection, HVAC, Indoor Air Quality, Insulation, Manufacturing, Multifamily, Net Zero Energy, Photovoltaics, Public Policy, Remodeling/DER, Renewables & The Grid, Research, Roofing, Single Family, Solar Thermal, The Big Picture, Electrical*

Beyond Green Construction
13 Terrace Vw.
Easthampton, Massachusetts 01027
413-529-0544
sean@beyondgreen.biz
http://beyondgreen.biz
Beyond Green Construction is a family owned and operated green building company based in Easthampton, MA. The BGC family, Sean, Andy and Jamey Jeffords, were raised in a tradition of craftsmanship, developed through apprenticeships with their father's company specializing in historic restoration and fine woodworking. The brothers honed their skills with additional education and experience for cutting edge green building, insulation and alternative energy techniques to prepare properties to meet the energy challenges of the 21st Century.
Specialties: *Remodeling/DER, Insulation*

Black Mountain Design Build
16 Academy St.
Saranac Lake, New York 12983
518-354-8340
info@blackmountaindesignbuild.com
http://www.blackmountaindesignbuild.com
Black Mountain Design Build provides exceptional service, thoughtful design, and step-by-step education enabling clients to meet their goals. The firm specializes in high quality, regionally focused design; high performance energy consulting; and ecologically sensitive landscape design. With a focus on sustainable design, BMDB can help clients achieve a variety of objectives from LEED certification and Net Zero energy use to ensure that your home is healthy and situated gracefully on its site.
Specialties: *Building Design & Construction, Design Process, Net Zero Energy*

Blue Sea Development Company, LLC
164 Main St.
Huntington, New York 11743
631-923-0081
les.bluestone@blueseadev.com
Blue Sea Development Company/Blue Sea Construction Company is an affordable housing developer/general contractor working primarily in the New York City metropolitan area.
Specialties: *Building Design & Construction*

BlueSel Home Solar, Inc.
600 W. Cummings Park, Ste. 4200
Woburn, Massachusetts 01801
781-281-8130
inquiry@bluesel.com
http://www.bluesel.com
BlueSel Home Solar provides high efficiency solar energy systems to homeowners and businesses in Massachusetts and Cape Cod. We have been in business since 2009. We can handle custom projects that require ground-mount systems, battery back-up, and high performance commercial systems for large businesses. We have two offices: Woburn, MA at 781-281-8130 and Sandwich, MA at 508-833-9500. Or email us at Inquiry@BlueSel.com. We are a certified Premier Sunpower Dealer.
Specialties: *Alternative Energy, Commercial & Institutional, Photovoltaics, Renewables & The Grid, The Big Picture, Electrical*

Bontrager Custom Builders, Inc.
1134 Bridgewater Ctr. Rd.
Bridgewater Corners, Vermont 05035
802-356-1856
brianbontrager76@gmail.com
http://www.bontragercustombuilders.com
I am a building contractor with 30 years of experience in the building and remodeling business of building fine custom homes.
Specialties: *Building Design & Construction, Single Family*

BPC Green Builders, Inc.
523 Danbury Rd.
Wilton, Connecticut 06897
203-563-9909
mike@bpcgreenbuilders.com
http://www.bpcgreenbuilders.com
Green building for new and existing homes based on building science and sustainability criteria. Award-winning builder with extensive local experience. 100% Energy Star (EPA) and Zero Energy Ready Homes (DOE). PHIUS Passive House, LEED for Homes (USGBC). PHIUS Certified Passive House Consultant services available.
Specialties: *Building Design & Construction, Consultancy, Remodeling/DER*

Briburn
28 Maple St., Ste. 202
Portland, Maine 04101
207-847-3788
cbriley@briburn.com
http://briburn.com
Design Philosophy:

"Architecture for life" is the creation of architecture that is timeless, environmentally friendly, beautiful, and long-lasting. Architecture that focuses on the experiences of the building's occupants, enhancing their daily lives with natural daylight, excellent ventilation, and delightful spaces that engage their artful minds, architecture that is mindful of our finite resources and respectful of the natural environment. It is architecture that will stand the test of time by being very durable, simple to operate, economical to maintain, and beautiful.
Our Mission:
Briburn is committed to creating innovative, energy efficient, green solutions for residential, commercial, Institutional and civic projects that artfully reflect our client's needs and interests.
Specialties: *Architecture, Beyond Energy, Building Design & Construction, Design Process, Education, Indoor Air Quality, Multifamily, Net Zero Energy, Passive Housing, Single Family*

Brissette Electric, Inc.
PO Box 4904
Vineyard Haven, Massachusetts 02568
508-693-0764
jarret@briselectric.com
http://www.briselectric.com
Brissette Electric, Inc. is a Martha's Vineyard based electrical contractor committed to customer service and quality. Our electricians take a team approach on every job and are dedicated to providing quality and performance that will exceed expectations.
We enjoy working with people, and will do everything possible to complete your project in a professional and timely manner.
Specialties: *Construction Process*

Brown Lindquist Fenuccio & Raber Architects, Inc.
203 Willow St., Ste. A
Yarmouthport, Massachusetts 02675
508-362-8382
kate@capearchitects.com
http://www.capearchitects.com
Brown Lindquist Fenuccio & Raber Architects, Inc. is a diversified architectural firm located in historic Yarmouthport, Massachusetts. We provide comprehensive architectural and consulting services to a wide range of Commercial, Civic and Residential clients.
Specialties: *Architecture*

Bruss Project Management
17 Springfield St.
Concord, New Hampshire 03301
603-856-8218
mdbruss17@gmail.com
Bruss Project Management provides Project Management Service from project start to completion. We work with Owners to tailor a scope of services uniquely suited to their project needs.
Specialties: *Commercial & Institutional, Construction Process, Consultancy, Design Process, Single Family*

Building Shelter, Inc.
PO Box 2297
Vineyard Haven, Massachusetts 02568
508-693-7734
info@buildingshelter.com
http://www.buildingshelter.com
We build homes from nature. Our construction practices are based on building science and the tradition of our trade. Our team is trained to understand how buildings work well and why they can cause harm. We are RESNET trained, a Certified Passive House Builder, Certified Passive House Consultant, EPA Lead Safe Certified Firm, certified Building Performance Institute Home Analyst Professional. Our carpenters are trained to understand that a house is more than parts assembly. A building incorrectly conceived and executed can be expensive to maintain and harmful to live in and harmful to nature on which we depend. We value honesty and good relationships with our clients, helping our community and respect for nature.
Specialties: *Building Design & Construction, Consultancy*

BuildingGreen, Inc.
122 Birge St., Ste. 30
Brattleboro, Vermont 05301
802-257-7300
jerelyn@buildinggreen.com
http://www.buildinggreen.com
BuildingGreen provides building industry professionals with well-researched information on environmentally sound building practices and green products. Online resources include BuildingGreen and LEEDuser.
Specialties: *Alternative Energy, Beyond Energy, Building Design & Construction, Education, Energy Conservation*

BuildingLogic, Inc.
PO Box 210
Gardiner, New York 12525
845-443-0657
lillianmaurer210@gmail.com
http://buildinglogicinc.com
We design and build beautiful high performance homes. Our full service company integrates traditional craft, science, and modern design, to create durable efficient homes that people love to live in. Certified Passive House Consultant and Tradesperson.
Specialties: *Building Design & Construction, Energy Conservation, Remodeling/DER*

Byggmeister, Inc.
667A Sawmill Brook Pkwy.
Newton, Massachusetts 02459
617-527-7871
info@byggmeister.com
http://www.byggmeister.com
Byggmeister is a residential design/build remodeling firm founded in 1983. Our priorities for each project are comfort, durability, and efficiency and a unique level of accountability.
Specialties: *Building Design & Construction, Remodeling/DER*

C

c&h architects
49 South Pleasant St., Ste. 301
Amherst, Massachusetts 01002
413-549-3616
info@coldhamandhartman.com
http://www.candharchitects.com
c&h architects is a full service architectural practice designing residential, commercial, and institutional buildings for mission-driven public, non-profit, and private clients. We create transformative designs for a renewable future, making buildings that are loved in the region where we live.
c&h: Design for the Next Hundred Years
Specialties: *Architecture, Energy Conservation, Remodeling/DER*

Caliper Studio
67 Metropolitan Ave., 2nd Fl.
Brooklyn, New York 11249
718-302-2427
info@caliperarch.com
http://www.caliperstudio.com
Caliper Studio is an integrated design office and metal fabrication shop located in Brooklyn, NY. Founded in 2003, Caliper offers both architectural services and custom metal fabrication to other architects, general contractors, and end users.
Specialties: *Building Design & Construction, Design Process*

Casaceli Construction, LLC
55 West St.
Northborough, Massachusetts 01532
508-351-9400
michaelcasaceli@gmail.com
Casaceli Construction, with over 30 years of experience, builds and remodels homes. Leveraging our experience, we are focusing on building in ways that are healthy for our clients and the Earth. Casaceli Construction has made a commitment to be a sustainable builder and remodeler and to pass the benefits on to our clients. With this commitment, we are offering deep energy retrofits and zero energy ready homes.
Specialties: *Building Design & Construction, Remodeling/DER*

Catchlight, Inc.
93R Border St.
Newton, Massachusetts 02465
617-934-4281
nigel@catchlightpainting.com
http://www.catchlightpainting.com
Catchlight Painting provides a full array of residential painting services to homeowners throughout Greater Boston and Metro West. We repair and paint contemporary and historic homes, inside and out, with the goal of achieving beautiful lasting results.

The health of our painters, the planet, you, and your home is also our priority. Catchlight paint crews adhere to all OSHA safety standards and are EPA lead-safe certified to work safely and legally wherever lead paint is present. In addition, we promote the use of professional-grade zero and low-VOC paints because these products are simply healthier for your family, your pets, our staff, and the environment.
Specialties: *Remodeling/DER, Single Family*

CED Greentech East
1559 King Street
Enfield , Connecticut 06082
Phone: 860-289-7711
solarteam@cedgreentecheast.com
http://www.cedgreentecheast.com/
CED Greentech East serves East of the Mississippi in the ever-expanding solar industry. We work closely with installers and have both excellent service and extensive experience in the electrical and photovoltaic fields. Our goal is to meet your project requirements at a competitive price, and to manage and deliver your system in a timely and professional manner. Our stock of material and accessories will help complete your jobs without any holdups! Greentech personally handles daily deliveries throughout the region, ensuring that your complete system arrives on time and at no additional cost to you! We get low freight rates through our corporate account and your order will be shipped out same day!
Specialties: *Cities & Communities, Commercial & Institutional, Education, Energy Auditing, Energy Conservation, Lighting Design, Lighting Supply, Photovoltaics, Electrical*

Celebration Green Design & Build
736 Boston Post Rd., Ste. C
Madison, Connecticut 06443
203-533-4689
bill@celebrationgreen.com
http://www.celebrationgreen.com
At Celebration Green Design & Build, we are proud to have been part of the emphasis on energy efficiency from its earliest phases when the Energy Star program began in the 1990's. Since then, we have been major advocates and practitioners of Green Building.
We combine our passion with our extensive knowledge & experience utilizing many types of energy efficient construction practices to design and build high performance homes, including passive house and zero net energy. In our spare time, we also endeavor to spread the word and teach other stakeholder groups "why, what & how" building this way matters for our future.
Specialties: *Building Design & Construction, Education, Net Zero Energy, Passive Housing*

Celtic Energy, Inc.
437 Naubuc Ave., Ste. 106
Glastonbury, Connecticut 06033
860-882-1515
wdonzila@celticenergy.com
http://www.celticenergy.com
Celtic Energy is an independent consulting firm founded to help energy users and associated organizations maximize their cost reduction and productivity benefits in the ever-changing energy marketplace.
Specialties: *Alternative Energy, Beyond Energy*

Center For EcoTechnology (CET)
320 Riverside Dr., Ste. 1-A
Florence, Massachusetts 01062
413-586-7350
cet@cetonline.org
http://www.cetonline.org
We help people and businesses save energy and reduce waste. For 40 years, we've offered proven advice and resources to save you money, make you more comfortable at home, and help your business perform better. Working with partners throughout the region, we're helping make our community a better place to live and work. We make green make sense.
Specialties: *Commercial & Institutional, Composting, Education, Energy Auditing, Energy Conservation, Insulation, Multifamily, Net Zero Energy, Renewables & The Grid, Single Family, The Big Picture, Wind*

Center For Sustainable Energy
50 Milk St., 16th Fl.
Boston, Massachusetts 02109
857-243-2021
elizabeth.glynn@energycenter.org
http://energycenter.org
A nonprofit social enterprise, CSE has facilitated 44,000 energy projects for consumers, businesses and governments. Through our market outreach and technical and policy expertise over 130,000 people have been directly served by our programs and CSE has a well-established reputation as a point of statewide and regional coordination among utilities, end-users, industry, regulators and local governments. Today, our reach is expanding nationally. Our areas of expertise include clean transportation, distributed generation, building performance, energy efficiency, energy storage and renewable energy. We work with energy policy makers, regulators, federal, state and local governments, utilities, public agencies and business.
Specialties: *Alternative Energy, Certifications & Standards, Commercial & Institutional, Consultancy, Education, The Big Picture*

Centerbrook Architects and Planners, LLP
67 Main St., PO Box 955
Centerbrook, Connecticut 06409
860-767-0175
coan@centerbrook.com
http://www.centerbrook.com
Centerbrook has been a leading firm in the practice of green and sustainable design since the 1970s. These are essential components of all its projects.
Specialties: *Alternative Energy, Architecture, Biomass, Building Design & Construction, Commercial & Institutional, Design Process, Envelope & Enclosure*

Central Home Energy Experts
9 North Maple St.
Woburn, Massachusetts 01801
781-933-8288
jbroughton@centralhomeenergy.com
http://www.centralhomeenergy.com
We recently opened a new division, Central Home Energy Experts, to help you prevent energy loss throughout your home all year round. We offer Mass Save® Home Energy Assessments as a Mass Save partner. We have the tools to provide a truly comprehensive home energy assessment. When we visit your home, we can evaluate its total "envelope,"ù including duct work and ventilation, insulation and weatherization, heating and cooling efficiency, indoor air quality and more. As a Mass Save partner and accredited members of the Building Performance Institute, we are the HVAC experts you can trust.
Specialties: *Energy Auditing, Energy Conservation, HVAC, Indoor Air Quality, Insulation, Single Family*

CircuitMeter, Inc.
266 Brook Ave.
North Plainfield, New Jersey 07060
888 350-1790
kelly.reiser@circuitmeter.com
http://www.circuitmeter.com
CircuitMeter has developed groundbreaking electrical energy submetering hardware, integrated with Big Data and cloud based CircuitMonitoring™ enterprise software. The advanced energy analytics is designed to analyze real time, circuit level energy usage for large organizations and portfolio managers. CircuitMeter's software can identify unnecessary and inefficient equipment usage at the circuit level, enabling users to better manage their consumption and reduce costs. CircuitMeter's leading edge technology has been validated by a growing list of utilities, NGOs, ESCOs and energy management and technology organisations, including NYSERDA which recently selected the company as a system provider and qualified vendor for the Real Time Energy Management (RTEM) program.
Specialties: *Energy Auditing, Energy Conservation, Information Technology*

City of Cambridge, Environmental and Transportation Planning Division
795 Massachusetts Ave.
Cambridge, Massachusetts 02139
617-349-4607
srasmussen@cambridgema.gov
http://www.cambridgema.gov/CDD/etdiv
The Environmental and Transportation Planning Division is responsible for improving the city's quality of life, by working to protect and improve the city's environment and natural resources and by planning improvements to the city's transportation system that encourage sustainable modes of travel, enhancing energy efficiency in public and private buildings, promoting sustainable energy sources and participating in similar regional efforts.
Specialties: *Social Services*

Clark & Green Architects
113 Bridge St.
Great Barrington, Massachusetts 01230
413-528-5180
info@clarkandgreen.com
http://www.clarkandgreen.com
Clark & Green, Inc. is committed to meaningful architectural design. Since 1988, it has applied its design principles to a variety of building types. In addition to residential work, the firm has executed major commercial, institutional and municipal projects. These include the adaptive reuse of an historic building into a mixed-use, six-screen cinema and the conversion of an athletic field house into a multi-use theater complex. The firm relies on strong relationships with consultants supporting the special needs of each project. Collaboration enables Clark & Green to integrate quality design with complex engineering requirements.
Specialties: *Architecture*

CLEAResult
50 Washington St., Ste. 3000
Westborough, Massachusetts 01581
508-836-9500
cara.russell@clearesult.com
http://www.clearesult.com
CLEAResult is the leading provider of energy efficiency programs and services. Our Building Performance Consulting and certification teams provide consultation and project management to advance high-performance buildings. We help owners and developers maximize performance and energy savings for commercial and residential buildings.
Specialties: *Consultancy, Consumer Information, Energy Conservation*

CMF Engineering, Inc.
24 Ridge Rd.
Longmeadow, Massachusetts 01106
413-567-1175
cmf.freedman@gmail.com
http://www.curtfreedman.com
Mechanical Engineering Consultation Services
We offer a wide range of services:
Forensic/investigative Engineering
Electric to natural gas conversions
Energy and water conservation
Utility management
Mechanical/structural inspections
Artesian well design
HVAC design
Boiler and chiller design
Indoor swimming pool HVAC design
Specialties: *Energy Conservation, Engineering, HVAC*

Coastal Windows & Exteriors, Inc.
100 Cummings Ctr., Ste. 236H
Beverly, Massachusetts 01915
978-304-0495
svanderbilt@mycoastalwindows.com
http://www.mycoastalwindows.com
Doing Things the Right Way Turns Out to be a Great Way to Grow Your Business
David and Stephanie knew that a home improvement company run with a customer-first attitude could do well. They just didn't realize how well until they launched.
When they started out, they only sold and installed windows, but customers love businesses that show them respect. As word got around people kept asking about other products and services and within several months they added doors, roofing and siding to meet the demand.
Stephanie and David are more committed than ever to maintaining Coastal Windows & Exteriors as a truly exceptional company.
Specialties: *Remodeling/DER, Roofing, Windows*

Community Preservation Corporation (CPC)
28 East 28th St., 9th Fl.
New York, New York 10016
212-869-5300
ederry@communityp.com
http://communityp.com
As a leading nonprofit affordable housing and community revitalization finance company, we utilize our deep, strategic relationships to create customized loan opportunities for our customers. As a trusted partner in your success, we work hand-in-hand with you to help maximize the potential of your multifamily project and its impact on the community. One of the biggest barriers to pursuing energy efficiency can be restricted access to sufficient capital. In an attempt to cut both costs and carbon footprints, CPC has developed a financing methodology to catalyze integration of energy efficiency and water conservation measures into construction loans. This allows for a quality retrofit that locks in energy and water savings, helping to ensure long term economic stability of the property.
Specialties: *Finance/CPA, Money & Business, Multifamily, Real Estate, The Big Picture*

Connecticut Green Bank
845 Brook St.
Rocky Hill, Connecticut 06067
303-459-7840
craig.connolly@ctgreenbank.com
http://www.ctgreenbank.com
The Connecticut Green Bank is the nation's first green bank. We're creating a thriving marketplace to accelerate green energy adoption in Connecticut by making green energy financing accessible and affordable for homeowners, businesses and institutions. We partner with private-sector investors to create low-cost, long-term, sustainable financing to implement green energy measures in the residential, commercial, industrial, institutional and infrastructure sectors.
Specialties: *Finance/CPA, Photovoltaics, Solar Thermal*

Conservation Solutions Corporation
162 Great Rd., Ste. 7
Acton, Massachusetts 01720
978-266-1900
dcook@conservationsolutions.com
http://www.conservationsolutions.com
Since 1993 Conservation Solutions Corporation has provided our customers with creative solutions to energy and water problems in their facilities and buildings. We accomplish the energy and water savings while keeping people comfortable and satisfaction a priority. In industrial facilities we increase efficiency and improve production. We are acknowledged experts in electronic resonance water treatment, water filtration, heat recovery, metering, efficient lighting, plug load efficiency, steam system optimization, heating and cooling system efficiency improvements and creative project financing.
We have a staff of dedicated experts available to troubleshooting problems and apply a line of proven and tested "state of the art" technologies.
Specialties: *Commercial & Institutional, Consultancy, Energy Conservation*

Consolidated Edison Company of New York, Inc. (Con Ed)
100 Summit Lake Dr., Ste. 410
Valhalla, New York 10595
212-460-4771
fedync@coned.com
http://www.coned.com/energyefficiency/
Con Edison provides energy to 3.4 million customers in New York and Westchester County, New York. Newsweek recently named the company the 'Greenest' utility in the United States. To learn more about our energy-saving programs, visit conEd.com/greenteam.
Specialties: *Alternative Energy*

Cornerstone Architecture
700 Richmond St., Ste. 110
London, Ontario N6A 5C7
519-432-6644
cornerstone@cornerstonearchitecture.ca
http://www.cornerstonearchitecture.ca
Established in 1991, our firm has developed a wide range of experience in a variety of sectors from children's facilities to seniors' communities; as well as educational, administrative, healthcare, and community projects. Our clients include both public and private sector organizations, as well as not-for-profit groups and private individuals. As the leading firm in our region, we encourage all of our clients to consider opportunities for reducing the impact of their buildings on the environment.
Specialties: *Architecture*

Cosella-Dörken Products, Inc.
4655 Delta Way
Beamsville, Ontario LOR 1B4
888-433-5824
tkimmel@cosella-dorken.com
http://www.cosella-dorken.com
Cosella-Dörken delivers innovative, high-performance air and moisture barriers for commercial and residential construction sold under the DELTA® brand name. Building green involves the business of manufacturing. Therefore we do not manufacture products or by-products which can negatively impact our world. We are very sensitive to protecting our environment and the people who are in our employ, while producing high quality, sustainable products that will create healthier living environments.
Specialties: *Indoor Air Quality, Manufacturing*

Cotuit Solar, LLC
3800 Falmouth Rd.
Marstons Mills, Massachusetts 02648
508-428-8442
katie@cotuitsolar.com
http://www.cotuitsolar.com
Solar thermal, photovoltaics, wind and wastewater alternative engineering, installation and serivce. In business since 1988.
Specialties: *Multifamily, Single Family, Mechanical Systems & Lighting, HVAC, Photovoltaics, Wind*

Crown Heights Jewish Community Council, Inc.
387 Kingston Ave.
Brooklyn, New York 11225
718-771-9000
mail@chjcc.org
http://www.chcentral.org
The Crown Heights Jewish Community Council (CHJCC) was created in 1969 in response to deteriorating social and economic conditions in the Crown Heights neighborhood of Brooklyn, with the mission of assisting all people of the the Crown Heights community with a focus on the rapidly growing Jewish population.
Specialties: *Social Services, The Big Picture*

Cushman Design Group, Inc.
100 Mountain Rd., PO Box 655
Stowe, Vermont 05672
802-253-2169
inquiry@cushmandesign.com
http://www.cushmandesign.com
Personalized full service architectural and interior design services for those who value elegant design, natural materials and green building practices in their home or business.
Specialties: *Architecture, Building Design & Construction, Commercial & Institutional, Design Process, Lighting Design, Multifamily, Net Zero Energy, Single Family*

D

David Murray Architect
61 Church Hill Rd.
New Paltz, New York 12561
845-384-2265
davidmurrayarchitect@gmail.com
http://www.hudsonvalleyarchitect.com
David Murray is a NYS licensed Architect based in New Paltz, New York. His practice consists of both Residential and Commercial projects in both Traditional and Contemporary Styles. The designs utilize Green strategies and products with super insulated, energy efficient design a priority. This is a small firm with great ideas and excellent client service.
Specialties: *Architecture, Commercial & Institutional, Net Zero Energy, Passive Housing, Single Family*

DEAP Energy Group, LLC
667 Sawmill Brook Pkwy.
Newton, Massachusetts 02459
617-775-4716
mduclos@deapgroup.comp.com
http://www.deapgroup.com
DEAP Energy Group provides comprehensive consulting services to improve the quality of life and energy efficiency of homes. Our work encompasses both new construction and existing home retrofits. We work on single-family homes, multi-family up to three stories, and small-scale commercial and institutional projects.
Specialties: *Building Design & Construction, Energy Conservation, Remodeling/DER*

Decumanus Green Design/Build, Inc.
29 Edgewood Dr., Ste. 2
Lenox, Massachusetts 01240
413-281-0046
joseph@decumanusgreen.com
http://www.decumanusgreen.com/
Decumanus Green provides both design and construction services. Whether you are looking to build new or remodel, we can help you to visualize and realize a new home that fits within your budget. At Decumanus Green we strive to make all of our building practices as environmentally responsible as possible and our homes and additions as energy efficient as possible. We keep ourselves abreast of the constantly developing world of sustainable design and building.
Specialties: *Building Design & Construction, Design Process, Remodeling/DER, Single Family*

Delta Products Corporation
4405 Cushing Pkwy.
Fremont, California 94538
888-979-9889
breezsales@deltaww.com
http://www.deltabreez.com
DeltaBreez Bathroom Ventilation Fans are ENERGY STAR qualified, extremely quiet fans with high energy efficiency. Powered by state-of-the-art DC motor technology, these fans consume up to 85% less energy than other leading fans; energy efficiency exceeds ENERGY STAR requirement by up to 367%; annual energy cost when run continuously is as low as $4.20. Delta is proud to be recognized for its never-ending commitment to innovative, clean and energy-efficient solutions for a better tomorrow.
Specialties: *Energy Conservation, Indoor Air Quality*

Demand Management Institute, Inc. (DMI)
300 Chestnut St., Ste. 150
Needham, Massachusetts 02492
781-449-5700
info@dmiinc.com
http://www.dmiinc.com
DMI specializes in providing expert consulting and engineering services to improve energy efficiency and operation of commercial, industrial, institutional, and large-scale residential facilities. DMI has established itself as one of the most respected energy engineering firms in New England with unsurpassed attention to detail and quality.
Specialties: *Energy Auditing, Energy Conservation*

DeMetrick Housewrights
201P Gravelly Hill Rd.
Wakefield, Rhode Island 01879
401-789-4712
sdemetrick@gmail.com
A residential building company in Rhode Island that specializes in high-performance building, millwork, and high-end remodeling.
Specialties: *Building Design & Construction, Design Process, Multifamily, Single Family*

Dietz & Company Architects, Inc.
17 Hampden St.
Springfield, Massachusetts 1103
413-733-6798
office@dietzarch.com
http://dietzarch.com
We offer a full range of architectural services for both the public and private sectors. This includes housing, education, healthcare, commercial, historic preservation and sustainable projects.
Specialties: *Architecture, Commercial & Institutional, Multifamily, Single Family*

Dominic Paul Mercadante Architecture
70 Waldo Ave.
Belfast, Maine 04915
207-338-4089
info@dpmercadante.com
http://www.dpmercadante.com
With over 20 years of experience I bring creativity and attention to detail to my practice of residential architecture creating buildings that perform well environmentally, functionally, and aesthetically.
Specialties: *Architecture, Building Design & Construction, Consultancy*

Donnell Carpentry
46 Hop Brook Rd.
Amherst, Massachusetts 01002
413-522-2051
ddonnell@crocker.com
Specialties: *Building Design & Construction, Construction Process*

Dryvit Systems, Inc.
1 Energy Way
West Warwick, Rhode Island 02893
401-822-4100
dean.balcirak@dryvit.com
http://www.dryvit.com
As a global leader contributing to sustainable buildings, Dryvit Systems is committed to providing quality products and services while considering people, planet, and prosperity in all business decisions.
We are recognized for developing the world's most energy efficient, architecturally diverse, insulated cladding systems and decorative finishes for vertical wall surfaces. Utilizing responsible chemistry and exceptional manufacturing processes, we conserve resources and minimize our environmental impact to support and enhance healthy, vibrant communities. With an engaged and empowered workforce, Dryvit embraces a sustainable culture and creates lasting value for our stakeholders.
Specialties: *Insulation, Manufacturing*

E

E2 Solar, Inc.
831 Main Street, Rte. 6A
Dennis, Massachusetts 02638
508-237-3892
jason@e2solarcapecod.com
http://www.e2solarcapecod.com
In 2008, E2 Solar was established to deliver high quality photovoltaic systems to residents and businesses on Cape Cod and the South Shore. Since then E2 has installed over 100 MW of photovoltaic and numerous solar thermal systems on residences and businesses across southeastern Massachusetts. Jason Stoots and the entire staff at E2 Solar, Inc. is committed to designing and installing exceptionally efficient, low maintenence, long lasting solar energy systems. E2 offers SunPower PV modules with the highest efficiency now available (cell efficiencies over 20%). Talk with one of E2 Solar's qualified solar site analysts today.
Specialties: *Photovoltaics, Solar Thermal*

eco_logic STUDIO, architecture & engineering, PLLC
2495 Main St., Ste. 431
Buffalo, New York 14214
716-834-9588
kevin@eco-logicstudio.com
http://www.eco-logicstudio.com
eco_logic STUDIO is an architecture, engineering, and planning firm focusing on green design and community revitalization. Specializing in high performance new and retrofit design of custom homes, affordable housing, institutional facilities, commercial development, urban design and planning, and green infrastructure. Certified Passive House Designer, Architects, and Engineer on staff. Experience in natural building, solar systems and living roofs. Architectural registration in NY, NJ, MI, NC, SC, and CT.
Specialties: *Architecture, Building Design & Construction, Cities & Communities, Consultancy, Design Process, Engineering, Envelope & Enclosure, Insulation, Multifamily, Net Zero Energy, Passive Housing, Roofing, Single Family*

Embue
50 Franklin St., 3rd Fl.
Boston, Massachusetts 02110
617-314-6260
robert@embue.com
http://www.embue.com
Our Mission: To make apartment building operations more efficient, comfortable, and cost-effective.
Our goal is the intelligent building that automates management tasks, optimizes resource use, and protects against loss, while providing a healthy comfortable environment tailored to residents' individual needs. With thoughtful application of technology we aim to transform multifamily portfolio, property management and resident experience in all segments of market. Embue was created by a group of engineers and entrepreneurs that are obsessive about making apartments work better so that you can worry less and enjoy more. Our team is highly engaged in creating what it means to live in, manage or own a smart apartment.
Specialties: *Commercial & Institutional, Energy Conservation, Multifamily, Information Technology*

Emerald Advisors & Consultants, Inc.
418 West 47th St., Apt. 4FE
New York, New York 10036
646-692-9892
emerald@emeraldsustainability.com
http://emeraldsustainability.com
Emerald Advisors & Consultants, Inc. is dedicated to providing financial, social, and environmentally sustainable solutions to benefit small- and medium-sized enterprises.
We offer expertise tailored to fit the needs and budgets of each individual entity, focused on identifying cost-savings and increasing profits. Our work is based on a data-driven and results-driven methodology developed by our Founder.
Emerald Advisors & Consultants, Inc. is a Certified Woman-owned Business Enterprise (M/WBE) by New York City and New York State.
Specialties: *Consultancy, Money & Business*

Emerald Builders
PO Box 299
Bowdoinham, Maine 04008
207-841-2775
reggie@emeraldbuild.com
http://emeraldbuild.com
Emerald Builders is a residential building company serving mid-coast Maine. We focus primarily on building sustainable and energy efficient homes and buildings. We work closely with our clients, designers, and subcontractors to bring their dreams to reality. We rely heavily on open communication between all parties from conception through project completion to make sure we've put out the best possible product for our clients. We pride ourselves on an unwavering commitment to the highest quality craftsmanship and to the environment.
Specialties: *Alternative Energy, Building Design & Construction, Construction Process*

Energy Federation, Inc. (EFI)
40 Washington St., Ste. 2000
Westborough, Massachusetts 01581
508-870-2277
joconnell@efi.org
http://www.efi.org
For over 30 years, EFI has assisted people in their efforts to use less energy and water by providing energy efficient products and delivering successful utility program services. Our Mission is to encourage people to use our planet's limited energy and water resources wisely. We assist people in these efforts by offering high quality conservation products and services at affordable prices while communicating practical, objective information. By following this mission, our work will lead to an improved quality of life and economic condition.
EFI a leading promoter of residential energy efficiency-related products, distributing products directly through our Consumer and Wholesale Divisions, and administrating utility-sponsored rebate programs through our Incentive Processing Division.
Specialties: *Building Design & Construction*

Energy Futures Group
PO Box 587
Hinesburg, Vermont 05461
802-482-5001
info@energyfuturesgroup.com
http://www.energyfuturesgroup.com
EFG is a consulting firm that provides clients specialized expertise on energy efficiency markets, programs and policies, with an emphasis on cutting-edge approaches. It was founded in April 2010 by Chris Neme, Richard Faesy, and Glenn Reed, each of whom has more than 20 years of experience in the energy efficiency industry.
EFG has worked with a range of clients "government agencies, consumer advocates, environmental advocates and utilities" in 24 states, 3 Canadian provinces, and several countries in Europe.
Specialties: *Consultancy, Public Policy*

Energy Hound
11 Broadway
Beverly, Massachusetts -1915
978-233-1433
ian@theenergyhound.com
http://www.theenergyhound.com
The Energy Hound is a certified energy auditor helping homeowners get maximum affordable results from energy efficiency measures they invest in, as well

as independent assessments for relief from window leaks, roof leaks and ice dams. Independent Energy Audits servicing eastern MA, southern NH, and eastern PA with written analyses that reveal yearly savings potentials of each energy scenario. This gives you the confidence to make decisions that achieve the best value for your money.

Energy Investment Systems
125 Maiden Ln., Rm. 505
New York, New York 10038
212-966-6641
eis@eisincorp.com
http://eisincorp.com
When building owners contemplate a major improvement program, it is the time to consider all of the energy performance opportunities available. EIS works with each client building to consider the highest performing and most appropriate energy equipment available, to review the configuration of the building's supply and generation of energy, and to integrate energy systems with user information technology. EIS works closely with its clients to develop custom improvement packages that maximize operating cost reductions and program incentives to offset capital costs. We produce long-term improvement packages with lifetime savings that can be several times the cost of the improvements. We assist clients to structure low-cost financing that keeps the project in the black from day one.
Specialties: *Money & Business, Multifamily*

Energy Opportunities, Inc.
1200 East Camping Area Rd.
Wellsville, Pennsylvania 17365
717-292-2636
sheffer@sevengroup.com
http://www.sevengroup.com
Energy Opportunities provides services focused on energy issues and the interface of nature and human enterprises. Founded in 1993, EO is also a part of 7group, LLC.
Specialties: *Alternative Energy, Architecture, Beyond Energy, Building Design & Construction, Certifications & Standards, Commercial & Institutional, Composting, Construction Process, Consultancy, Design Process, Education, Energy Auditing, Energy Conservation, Engineering, Envelope & Enclosure, HVAC, Indoor Air Quality, Insulation, Lighting Design, Multifamily, Net Zero Energy, Passive Housing, Pavement, Photovoltaics, Renewables & The Grid, Research, Roofing, Solar Thermal, The Big Picture, Wind, Windows*

Enterprise Community Partners, Inc.
1 Whitehall St., 11th Fl.
New York, New York 10004
212-262-9575
http://www.enterprisecommunity.com
Since 1982, Enterprise has raised and invested more than $14 billion to help finance nearly 300,000 affordable homes across the United States. Our award-winning Enterprise Green Communities initiative offers the first national framework for green affordable housing.
Specialties: *Social Services, The Big Picture*

European Architectural Supply (EAS)
144 North Rd., Ste. 2500
Sudbury, Massachusetts 1776
617-647-4432
pmuzila@eas-usa.com
http://www.eas-usa.com
Supplier of high-quality Passive House certified windows, doors and curtain wall from Schuco and Makrowin. Products include entry doors, tilt-turn windows, lift-slide doors and are available in PVC, wood, aluminum, and commercial curtain wall.
Specialties: *Envelope & Enclosure, Net Zero Energy, Passive Housing, Windows*

EvB Design
1310 Broadway
Somerville, Massachusetts 02144
617-623-2222
edrick@evbdesign.com
http://evbdesign.com
EvB Design provides architectural services for custom designed energy efficient housing, from single family to multi-family housing.
Specialties: *Architecture*

F

Farley Built, Inc.
50 Dr Fisher Rd.
West Tisbury, Massachusetts 02575
803-547-5727
fjpedler@gmail.com
The West Tisbury construction company, owned by Farley Pedler, specializes in custom homes with an emphasis on energy efficiency.
Specialties: *Building Design & Construction, Single Family*

Foam USA, LLC
180 Pleasant St., Ste. 200
Easthampton, Massachusetts 01027
413-529-0200
info@usasprayfoam.com
http://www.usasprayfoam.com
Foam USA specializes in high performance building envelope enclosures. We offer the most energy-efficient insulation technology available for commercial, industrial, residential buildings throughout New England. Our services include installation of closed-cell and open-cell spray polyurethane foam, elastomeric roof coatings and intumescent fire barrier coatings.
Specialties: *Commercial & Institutional, Insulation, Multifamily, Single Family, The Big Picture*

Foard Panel, Inc.
PO Box 185
West Chesterfield, New Hampshire 03466
800-644-8885
alison@foardpanel.com
http://www.foardpanel.com
Foard Panel manufactures and installs structural insulated panels for residential and commercial construction.
Specialties: *Insulation, Manufacturing*

Fred Davis Corporation
120 North Meadows Rd., Ste. 3
Medfield, Massachusetts 02052
800-497-2970
info@freddaviscorp.com
http://www.freddaviscorp.com
Fred Davis Corporation is a leading independent nationwide wholesale distributor dealing exclusively with energy efficient lighting products since 1983. Whether you are looking for CFLs at the best possible price or for advice on what type of fixture is best for an application, Fred Davis Corporation is your one-stop supplier.
Specialties: *Lighting Supply, Energy Conservation, Education*

Futuro, Inc.
371A Islington St.
Portsmouth, New Hampshire 03801
603-294-4222
matt@futuroconstruction.com
http://www.futuroconstruction.com
Futuro: Seacoast NH and Southern Maine's go-to source for Zero Energy Homes and Green Construction.
Specialties: *Construction Process, Net Zero Energy, Single Family*

G

Garland Mill Timberframes
273 Garland Rd.
Lancaster, New Hampshire 03584
603-788-2619
mail@garlandmill.com
http://www.garlandmill.com
Garland Mill is a small family-owned business, specializing in the design and construction of heavy timberframed structures and high performance homes.
Garland Mill has designed and built a variety of super-insulated buildings over the last 14 years. Net Zero has become a particular sweet spot, but we are excited to pursue any building project that integrates exceptional energy performance with beautiful and durable craftsmanship.
While the heart of our business is the design and construction of high performing buildings, the soul of our business resides in our old water powered sawmill that has been in continuous operation since 1856. We use the mill to saw the timber and lumber we use in our homes. When not sawing, the mill's micro hydro-electric generator produces clean energy.
Specialties: *Building Design & Construction, Design Process, Net Zero Energy, Passive Housing, Solar Thermal*

Geoffrey H. Richon Company, Inc.
19 Duncan St.
Gloucester, Massachusetts 01930
978-283-6063
tsrichon@ghrichon.com
http://www.ghrichon.com
The Geoffrey H. Richon Company specializes in delivering high quality construction, remodeling, and consulting services to Cape Ann and Essex County. Our experience is based on over 35 years in residential construction and remodeling. Through a whole-system approach to design and construction, we provide our clients with a high level of energy efficiency, comfort and durability for their projects.
Specialties: *Building Design & Construction, Consultancy, Envelope & Enclosure, Net Zero Energy, Passive Housing, Remodeling/DER, Single Family*

George Penniman Architects, LLC
35 Pratt St., Unit 202, PO Box 338
Essex, Connecticut 06426
860-767-2822
george@pennimanarchitects.com
http://www.pennimanarchitects.com
George Penniman Architects, LLC, is a full-service, client oriented firm working on large and small scale residential projects, as well as small commercial and institutional projects throughout New England. Our work is characterized by its contextual nature, high performance building practices and environmental stewardship.
Specialties: *Architecture, Commercial & Institutional, Design Process, Landscape Design, Multifamily, Single Family*

Godfrey Design-Build
14 Roundy St. #2
Beverly, Massachusetts 01915
978-473-0987
pat@godfreydesign-build.com
http://www.godfreydesign-build.com
Godfrey Design-Build is a full-service remodeling company. Our process allows our clients to hire one company for all their design, scope development and construction services. This is different from the "traditional" design-bid-build approach where clients are responsible for hiring designers, architects, engineers, contractors and subcontractors. We combine these services into one package so we can offer more value and simplify a challenging process.
Specialties: *Building Design & Construction, Design Process, Remodeling/DER*

Gotham 360
48 Wall St., Unit 10
New York, New York 10005
917-338-1023
contact@gotham360.com
http://www.gotham360.com
Our integrated service offerings showcase our areas of deep industry expertise. Delivering targeted solutions that address business-critical energy concerns, our service set includes:
Commodity Risk Management
Energy Management for Non Profit Institutions
Sustainability
Combined Heat & Power
Financing
Specialties: *Consultancy, Finance/CPA, Money & Business*

The Green Engineer, Inc.
54 Junction Square Dr.
Concord, Massachusetts 01742
978-369-8978
info@greenengineer.com
http://www.greenengineer.com
The Green Engineer, Inc. is a sustainable design consulting firm specializing in solutions to design, build, and operate buildings with improved energy efficiency and reduced impact on the environment. Founded in 2005 by Chris Schaffner, PE, LEED Fellow, the firm has a technical staff of fifteen LEED-Accredited Professionals. The expert team brings to the table experience and perspective from a variety of backgrounds including engineering, architecture, construction, planning, development, and public policy.
Specialties: *Design Process*

Green Mountain College/Griswold Library
1 Brennan Cir.
Poultney, Vermont 05764
802-287-8303
millettep@greenmtn.edu
http://www.greenmtn.edu/academics/learning-resources/griswold-library
Green Mountain College prepares students for fulfilling lives by taking the goal of creating just and sustainable societies as the unifying theme for its interdisciplinary graduate and undergraduate liberal arts education. The College fosters the ideals of environmental and personal responsibility, civic engagement, entrepreneurial spirit, and global understanding.

H

H2O Degree-Global Water & Energy Solutions
3580 Progress Dr., Ste. L
Bensalem, Pennsylvania 19020
215-788-8485
rwhiffen@h2odegree.com
http://www.h2odegree.com
H2O Degree uses a wireless based technology to monitor, control, and quantify utility consumption in multifamily buildings.We provide sub-metering solutions for electric and hydronic heating and cooling, as well as toilet leak detection.
Specialties: *Energy Conservation, Energy Auditing, Education*

Hampshire Council of Governments
99 Main St., Ste. 101
Northampton, Massachusetts 01060
413-584-1300
jengelson@hampshirecog.org
http://www.hampshirecog.org
The Hampshire Council of Governments is a consortium of towns solving local problems by acting regionally. Our sustainability services include:
Solar Renewable Energy Credit Aggregation: We broker SRECs,keeping solar money local and providing local photovoltaic system owners top dollar for their credits. We currently act as a broker for 118 solar installations and more come in every day.
Municipal Solar Program: We are linking Western Massachusetts communities with a fully vetted, local solar vendor who will provide the best possible solar installation arrangement without all the hassle of an RFP or legal vetting. Let us do the work; your community can enjoy the great solar deal from someone you can trust.
Specialties: *Alternative Energy, Consultancy, Consumer Information, Solar Thermal*

Hancock Software, Inc.
28 Gilleonard Ln.
Framingham, Massachusetts 01701
508-405-2688
info@hancocksoftware.com
http://www.hancocksoftware.com
Hancock Software Inc. is a Massachusetts-based energy efficiency software company that helps its partners increase their energy efficiency installation's cost effectiveness by providing a technology that brings all parties and activities to one platform.
The platform includes fully integrated mobile apps for field personnel, as well as an online program portal where utility, implementation, contractors, and customers interact and monitor their pipeline, energy savings and production goals.
Today's Energy Efficiency DSM challenge is to achieve more energy savings with lower costs. If you are in the market for an proven approach to DSM tracking & management solution that will significantly reduce labor costs, consider Hancock One™.
Specialties: *Alternative Energy, Commercial & Institutional, Energy Auditing, Energy Conservation, Geothermal, Home Inspection, HVAC, Indoor Air Quality, Insulation, Lighting Design, Manufacturing, Multifamily, Renewables & The Grid, The Big Picture*

Hands-On Construction
25 Upland Rd.
Concord, Massachusetts 01742
978-369-4605
lise@handsonconcord.com
http://www.handsonconcord.com
Hands-On Construction is a full-service, design/build residential remodeling company specializing in kitchen and bath remodel, additions, whole house renovation as well as new home construction. Established in 1982, our mission is to deliver excellent design, expert craftsmanship, and superior service while adding value and beauty to your home.
Hands-On Construction takes great pride in delivering the highest quality product. We are proud to say that 85% of our customers are either repeat customers or those referred to us by previous customers. Creating and maintaining customer satisfaction is our business. We look forward to working with you.
Specialties: *Building Design & Construction, Remodeling/DER, Windows*

Hardwick Post & Beam
272 Fleming Rd., PO Box 225
Hardwick, Massachusetts 01037
413-426-6315
contact@hardwickpostandbeam.com
http://www.hardwickpostandbeam.com
We are a company of craftspeople. For 33 years we have designed and built beautiful, custom, timber frame structures for clients in Massachusetts, New England, and across the United States. A family company in its second generation of leadership, we have been employing a group of timber framers year-round for more than three decades, and are committed to our people.
We are very eager to work with architects and builders who are in the front line of cutting edge energy sustainability and who want to pair their product with the beauty and tradition of a timber frame.
Our bottom line is designing and fabricating one frame at a time, bringing all of our resources, passion and experience to delivering the perfect timber frame for each specific client, site, and budget - every time.
Specialties: *Building Design & Construction, Construction Process, Design Process*

Healthy Home Energy & Consulting, Inc.
200 Tomahawk St.
Yorktown Heights, New York 10598
914-242-9733
info@gethealthyhome.com
http://www.gethealthyhome.com
A leading provider of Home Performance Services in the Tri-State Area, Healthy Home Energy and Consulting is on a mission. For too long, homeowners have been putting up with cold, damp, and inefficient homes. As a sister company to Brenner Builders, our 25 years of experience in residential construction makes us well suited to diagnose, recommend, and implement whole house energy savings solutions.
Our own employees use top of the line products and cutting edge equipment, providing you with the highest quality standards possible. We arrive on time, when we say we will, and leave your home neat and tidy when we leave.
Specialties: *Consultancy, Indoor Air Quality*

Heartwood Group, Inc.
165 Evergreen St.
Providence, Rhode Island 02906
401-861-1650
unger@hrtwd.com
http://www.heartwoodsolutions.com
Our company was founded in 1983 to create environmentally responsible buildings. Today we provide consulting and development services in the renewable energy and building industries.
Specialties: *Alternative Energy, Beyond Energy, Consultancy, Energy Conservation, Money & Business, Photovoltaics, Real Estate, Renewables & The Grid, The Big Picture, Wind*

Heat-Timer Corporation
20 New Dutch Ln.
Fairfield, New Jersey 07004
973-575-4004
apetruziello@heat-timer.com
http://www.heat-timer.com
Heat-Timer is one of the leading manufacturers of automated heating controls for the HVAC/R and Plumbing Industry.At Heat-Timer, our goal is to provide innovative, cost effective control solutions that enhance the comfort and efficiency of new and existing buildings. In doing so, we reduce the environmental impact of building heating systems worldwide- often within the imperfect framework of existing mechanical systems.
For over 75 years, Heat-Timer products have been manufactured in the United States. The diversity of Heat-Timer controls, as well as their extraordinary fine-tuning capability, means improved performance of virtually any building's heating system- old or new, large or small, steam or hydronic.
Specialties: *Commercial & Institutional, Energy Conservation, HVAC, Manufacturing*

HELM Construction Solutions
61 Upper Forest St.
Brattleboro, Vermont 05301
802-225-8933
kate@buildhelm.com
http://www.buildhelm.com
At HELM, we work with owners, designers and builders to create high performance and sustainable buildings and businesses. HELM provides a range of innovative services to help your business and your projects run smoothly and efficiently. We're here to help support your business in whatever way you need, by offering expertise in business planning, accounting, estimating, job costing, project management, hiring, technology, software, and marketing that is specific to the high performance design and construction industry and the small business world.
Specialties: *Building Design & Construction, Construction Process, Consultancy*

Home Energy Technologies
PO Box 364
Chester, Connecticut 06412
877-800-6440
peter@homeenergytechnologies.com
http://www.homeenergytechnologies.com
Home Energy Technologies is a RESNET- accredited Home Energy Rating System Provider. Our services include HERS ratings, ENERGY STAR & NGBS certification, comprehensive home energy audits, building performance testing, and other energy diagnostic and analytical services. Our clients include architects, builders, and owners of single-family and multi-family homes in Connecticut and adjoining areas.
Specialties: *Consultancy, Energy Auditing, Energy Conservation*

Hudson River Design
120 Lighthouse Dr.
Saugerties, New York 12477
845-246-0725
chuck@chucksilver.com
http://www.chucksilver.com
Hudson River Design has been designing low energy-use and net-zero homes in NY's Hudson Valley for over 30 years. We create extraordinary buildings, including the Greenest Building in NY.
Specialties: *Building Design & Construction*

Hudson Valley Community College
80 Vandenburgh Ave., Ste. 1
Troy, New York 12180
518-629-7075
s.schiffer@hvcc.edu
https://www.hvcc.edu
Hudson Valley Community College's Malta facility, TEC-SMART, stands for Training and Education Center for Semiconductor Manufacturing and Alternative and Renewable Technologies. TEC-SMART serves as a community resource for demonstrating energy efficient design and building techniques and ties into several of the College's education and training programs. Incorporating green building techniques, as well as passive solar design in construction it achieved US Green Building Council's LEED platinum certification in 2011.
Specialties: *Commercial & Institutional, Education, Money & Business*

I

In Posse
1500 Walnut St., Ste. 1414
Philadelphia, Pennsylvania 19102
215-282-6800
info@in-posse.com
http://www.in-posse.com
In Posse provides consulting and engineering design services for high performance, deep green projects with a special expertise in net-zero energy. At In Posse, we focus exclusively on the energy and sustainable design sectors of the built environment for clients in a broad range of market sectors. Our services address all aspects of building performance including modeling and analysis of building systems, engineering high performance building systems, commissioning and occupant education and engagement. In Posse is a subsidiary of AKF Group and is headquartered in Philadelphia, PA with an office in New York, NY.
Specialties: *Consultancy, Energy Conservation, Engineering*

Independence Solar
50 Franklin St., Ste. 421
Boston, Massachusetts 02110
617-938-3599
info@independencesolar.com
http://www.independencesolar.com
Independence Solar is a developer and installer of turnkey commercial solar energy projects. Since 2007, their team of renewables experts have managed the development of over $200 million of solar projects, including the largest rooftop solar array (9 MW) in North America at the Gloucester Marine Terminal in NJ.
Specialties: *Alternative Energy, Photovoltaics*

Infrared Diagnostic, LLC
9 Elaine Rd.
Sudbury, Massachusetts 01776
978-440-9900
info@infrareddiagnostic.com
http://www.infrareddiagnostic.com
Infrared energy audit, Duct Blaster and Blower Door testing. Certified Infrared Thermographer, HERS Rater. Provide consulting to builders, home owners on how to reduce energy consumption. Stretch Code and 2012 IECC consulting.
Specialties: *Consumer Information, Energy Auditing, Energy Conservation, HVAC, Insulation, Roofing, Single Family, Electrical*

InSoFast, LLC
PO Box 1225
Mitchell, South Dakota 57301
484-668-1414
dean@insofast.com
http://www.insofast.com
InSoFast, LLC, since 2006, manufactures single component continuous insulation panel. This panel combines do-it-yourself simplicity with cutting edge performance. InSoFast is an engineered alternative to the complex, multi-part conventional field assembled systems. InSoFast's R-10 continuous panel performs like a continuous insulated membrane that incorporates dual rainscreen layers and 16" o.c. framing. The non- conductive studs are covered with a 1/2" of foam to eliminate the thermal short circuits that plagues traditionally installed sidings. With millions of square feet in place and thousands of happy customers, why work so hard just to do it right, when you don't have to?
Specialties: *Building Design & Construction, Commercial & Institutional, Construction Process, Energy Auditing, Energy Conservation, Envelope & Enclosure, Indoor Air Quality, Insulation, Manufacturing, Multifamily, Net Zero Energy, Passive Housing, Remodeling/DER, Research, Single Family*

Integral Building & Design, Inc.
PO Box 96
New Paltz, New York 12561
845-255-0418
pasquale@integralbuilding.com
http://integralbuilding.com
Integral Building & Design, Inc. is an independent and locally-based team of building performance professionals committed to energy efficiency and sustainability. Specializing in high performance building and deep-energy retrofits, we provide building professionals and homeowners with resources and experience to achieve maximum home performance. We believe that buildings should be safe, affordable, and made to last generations.
Specialties: *Building Design & Construction, Construction Process, Design Process, Remodeling/DER, Single Family*

Integrata Architecture + Construction
419 Palmer Ave., Ste. 200
Falmouth, Massachusetts 02540
508-495-6575
info@integrata-ac.com
http://www.integrata-ac.com
INTEGRATA is an architecture and construction company based in Falmouth, MA serving the greater New England area. From site development to material selection, all our work is guided by sustainable design and construction practices.
Specialties: *Architecture, Single Family, Multifamily, Commercial & Institutional, Design Process, Building Design & Construction*

Integrated Eco Strategy
PO Box 417
Williamstown, Massachusetts 01267
413-884-2571
charley@integratedecostrategy.com
http://www.integratedecostrategy.com
Integrated Eco Strategy is a consulting firm that focuses on sustainability planning, building energy efficiency, and green building certification. Our clients include architecture and engineering firms, institutions of higher education, not-for-profits and homeowners.
Specialties: *Building Design & Construction, Commercial & Institutional, Consultancy*

Integrated Solar Applications Corporation
121 Spring Tree Rd.
Brattleboro, Vermont 05301
802-257-7493
info@isasolar.com
http://www.isasolar.com
We specialize in the design, service & installation of renewable energy systems, including solar thermal hydronic, photovoltaic, small wind, micro-hydro, biomass & hybrid systems.
Specialties: *Multifamily, Single Family, Mechanical Systems & Lighting, HVAC*

J

Jack Miller Contractors, Inc.
158 Sand Springs Rd.
Williamstown, Massachusetts 01267
413-884-6124
jack@jackmillercontractors.com
http://www.jackmillercontractors.com
Residential Contractors specializing in high-performance homes and remodeling.We're a full-service general contractor experienced in a variety of construction and energy retrofit strategies, including ICF, double-stud wall and exterior insulation, air, thermal and water management strategies and mechanical systems.Our goal is to combine traditional craftsmanship with high performance materials and techniques to achieve the holy grail of beauty, durability and performance for our clients.
Specialties: *Building Design & Construction, Remodeling/DER*

Jim Muka, Window Sales
139 Silvio O Conte Dr.
Greenfield, Massachusetts 01301
413-774-6975
jimmuka212@gmail.com
Independent window and door sales representataive. Over 36 years of experience in the residential and commercial window and door industry. Providing direct sales of both high performance fiberglass and speciality clad/wood and all wood windows and doors. Alpen Fiberglass Window and Door Direct Sales Representative. Builder and Architect direct price quotes, budget pricing, product service. Homeowner direct sales / service.
Specialties: *Windows*

John Fülöp Associates, Architects and Planners
103 East Alford Rd., PO Box 378
West Stockbridge, Massachusetts 01266
413-232-7122
john@fulopassociates.com
http://www.fulopassociates.com
John Fülöp Associates, Architects provides design services for all building types, creating aesthetically pleasing, economic green architecture throughout the Northeast.
Specialties: *Building Design & Construction, Energy Conservation, Remodeling/DER*

Jones Whitsett Architects, Inc.
308 Main St., Ste. 3A
Greenfield, Massachusetts 01301
413-773-5551
office@joneswhitsett.com
http://www.joneswhitsett.com
Formed in 1984, we specialize in schools, civic/cultural buildings & historic preservation. We share a commitment to a collaborative design process, respect for the architectural traditions of our region & concern for future generations.
Specialties: *Architecture, Building Design & Construction*

Jordan Institute, Inc.
and Resilient Buildings Group
6 Dixon Ave., Ste. 201
Concord, New Hampshire 03301
603-226-1009
lrichardson@jordaninstitute.org
http://www.jordaninstitute.org
The Jordan Institute is a non-profit focusing efforts on high-performance energy-efficiency and renewable-energy policy, program design, and project implementation in New Hampshire's commercial buildings. Jordan Institute launched its majority-owned for-profit subsidiary, Resilient Buildings Group, Inc., in 2013 to handle energy audits, building commissioning, monitoring and verification, LEED consulting and certification, energy-centric construction management, and energy-project advocacy and consulting. In 2015, Jordan Institute is launching an innovative statewide C-PACE financing program, as well as focusing on public policy issues such as an Energy Efficiency Resource Standard, updating energy codes, and publicly funded energy programs and policies.
Specialties: *Alternative Energy, Biomass, Building Design & Construction, Certifications & Standards, Cities & Communities, Commercial & Institutional, Construction Process, Consultancy, Design Process, Energy Auditing, Energy Conservation, Envelope & Enclosure, Finance/CPA, HVAC, Indoor Air Quality, Insulation, Mechanical Systems & Lighting, Money & Business, Multifamily, Net Zero Energy, Photovoltaics, Public Policy, Remodeling/DER, Solar Thermal*

K

Kaplan Thompson Architects
102 Exchange St., 2nd Fl.
Portland, Maine 04101
207-842-2888
info@kaplanthompson.com
http://www.kaplanthompson.com
Our mission is to bring beautiful, sustainable, and attainable buildings to the world. From your home to your business, we can design the sustainable building you have been looking for.
Specialties: *Architecture, Multifamily, Net Zero Energy, Passive Housing, Remodeling/DER, Single Family*

Kelly Taylor Interior Design
460 Harris Ave., Unit 203
Providence, Rhode Island 02909
401-437-6363
ktaylor@ktid.net
http://www.ktid.net
Residential and commercial interior design firm experienced in new construction, renovations, adaptive re-use, and sustainable materials/systems.
Specialties: *Architecture, Design Process, Indoor Air Quality*

Kent Hicks Construction Company
PO Box 57, 634 Main Rd.
West Chesterfield, Massachusetts 01084
413-296-0123
khicksconstruction@verizon.net
http://www.kenthicksconstruction.com
Our clients often want both high quality and low environmental impact as they build, renovate, or restore their home. They want to reduce energy costs, achieve greater energy independence, and protect their health from toxic chemicals. Whether you want to make your own energy, invest for long-term energy security, live in a 'healthy' home, or protect the environment, we have the experience to help you choose the best design and materials for your high-performance green home. We know the full range of products, construction materials, and building processes at all levels. Our team has experience with contractors who can provide a full range of systems for efficient heating, cooling and ventilation, and for generating your own energy.
Specialties: *Building Design & Construction, Remodeling/DER*

Klepper, Hahn & Hyatt
5710 Commons Park Dr.
East Syracuse, New York 13057
315-446-9201
jad@khhpc.com
http://www.khhpc.com
- Structural building designs that integrate with high-performance building envelopes
- Detailing facades and buildings to minimize thermal bridging
- Design of Structural Insulated Panel (SIP) structures
- Design of Insulated Concrete Form (ICF) structures
- Design of Frost-Protected Shallow Foundations (FPSF)
- Building envelope consultation
- Infrared building reviews by trained thermographers
- Building Envelope Commissioning (BECx)
- Special structural inspections and construction inspection of envelopes
- Structural and building envelope forensics
- Structural consulting for PV's, wind turbines, green roofs, etc.
- Calculation of CO2e footprints of the construction of structures and envelopes
- Estimating annual energy and carbon savings of envelope improvements
Specialties: *Building Design & Construction, Commercial & Institutional, Construction Process, Consultancy, Design Process, Education, Energy Conservation, Engineering, Home Inspection, Landscape Design, Multifamily, Pavement, Roofing, Wind*

Kolbert Building
90 Gray St.
Portland, Maine 04102
207-799-8799
dan@kolbertbuilding.com
http://www.kolbertbuilding.com
We focus on bringing energy efficiency and healthy home techniques to all of our work, from small renovations to complete new houses. We are active members of NESEA, and run a local building science discussion group.
Specialties: *Building Design & Construction, Consultancy, Remodeling/DER*

KOW Building Consultants
1034 West Jericho Tpke.
Smithtown, New York 11787
631-757-5000
kevinw@kowbc.com
http://www.kowbc.com
KOW Building Consultants has been a trusted provider of construction consulting services since 1978. We add value to traditional banks, private lenders, mortgage lending institutions, state housing agencies, city housing agencies, mezzanine lenders, and other financial institutions by providing construction loan monitoring, property condition assessment, and technical plan & cost reviews.
Specialties: *Consultancy, Finance/CPA*

Kraus Fitch Architects, Inc.
110 Pulpit Hill Rd.
Amherst, Massachusetts 01002
413-549-5799
mkraus@krausfitch.com
http://www.krausfitch.com
Kraus Fitch Architects offers a full range of services emphasizing ecologically sound and socially responsible design. Our work ranges from deep energy retrofits and zero net energy buildings to cohousing communities and other smart-growth projects. Our interactive approach allows us to realize your vision with practical, innovative, and cost-effective solutions. Skilled in group process facilitation and active listening, we build consensus within families, communities, and building committees. We have received numerous awards for green design and smart growth development, are internationally recognized for our expertise in cohousing, and were named one of the Top Ten Green Architects for 2005 by Natural Home and Garden magazine.
Specialties: *Architecture, Commercial & Institutional, Multifamily, Net Zero Energy, Remodeling/DER*

L

Landmark Services, Inc.
326 Washington St. Anx.
Wellesley Hills, Massachusetts 02481
508-533-8393
brian@landmarkservices.com
http://www.landmarkservices.com
Landmark Services, Inc. specializes in renovating and restoring period homes. We also build new, energy efficient homes inspired by traditional architecture. We believe that saving old homes can and should be a key part of any sustainable housing strategy in New England and beyond. Building Zero Net Energy/ Renewable new homes aligns with the principals' life long passion for fostering and supporting sustainable innovation. We believe that it is our highest calling as builders and citizens to be conscious, compassionate stewards of the natural world. Wherever we can we support people and businesses that share this mission.
Specialties: *Building Design & Construction, Construction Process, Net Zero Energy, Remodeling/ DER, Single Family*

Lassel Architects PA
PO Box 370, 370 Main St.
South Berwick, Maine 03908
207-384-2049
info@lasselarchitects.com
http://www.lasselarchitects.com
Lassel Architects PA is an architectural and planning firm founded in 1989. We have been designing sustainable and energy efficient structures for over 20 years. The firm provides a broad range of services with experience in a variety of project types. All members of our design team are LEED Accredited Professionals and one is also a Building Performance Institute (BPI) Certified Building Analyst. Our portfolio of work includes renovation and new construction projects, in commercial, institutional, health care, retail, multi-family housing and unique single family residences of various sizes and budgets. We treat all of our projects, be they small or large, with the same care and thought to achieve our clients' goals.
Specialties: *Architecture, Commercial & Institutional, Multifamily, Single Family*

Lewis Creek Builders
909 Long Point Rd.
North Ferrisburgh, Vermont 05473
802-999-6942
mark@lewiscreekbuilders.com
http://www.lewiscreekcompany.com
Our Company has four integrated divisions: Design, Build, Energy, and Education.
We offer traditional design/build residential services which are coupled with expertise in renewable energy, high performance homes, and passive house construction. What makes us special is our whole systems approach which includes not just the built environment but the education of the public and homeowners in matters related to sustainability and generative living.
Specialties: *Building Design & Construction, Education, Energy Conservation*

Little Green Homes
13 Alden Ave.
Greenland, New Hampshire 03840
603-319-8095
chris@littlegreenhomes.com
http://www.littlegreenhomes.com
Little Green Homes, LLC is a residential design-build company focusing on healthy, durable, and energy efficient new homes and renovation/addition projects.
Specialties: *Building Design & Construction*

M

M.G. Kane Properties, Inc.
162 Pond St.
Ashland, Massachusetts 01721
508-881-8882
mg.kane@verizon.net
http://www.mgkaneproperties.com
M.G. Kane Properties specializes in building "Net Zero Energy Attainable" homes.
Specialties: *Real Estate*

M.J. Moran, Inc.
4 South Main St., PO Box 278
Haydenville, Massachusetts 01039
413-268-7251
info@mjmoraninc.com
http://www.mjmoraninc.com
The M.J. Moran Company was formed in February of 1978, and has steadily grown in size since then. Our repeat customers include Top Flite/Callaway Golf, Milton Bradley, Suddekor, Smith College, Mount Holyoke College, Amherst College, Eaglebrook School, Northfield Mount Hermon, and the Cooley Dickinson Hospital, just to name a few. As Mechanical Construction Manager, we working closely with the Architect, Engineers, and Owner, providing our expertise in value costing, budgeting and scheduling. Project Services: Plumbing, HVAC Systems, Process Piping Systems, High Pressure Gas & Steam Systems, Medical Gas Systems, Design/Build Services, Mechanical Construction Management.
Specialties: *Building Design & Construction, Commercial & Institutional, Construction Process, Design Process, Engineering, HVAC, Multifamily, Single Family*

Maclay Architects
4509 Main St.
Waitsfield, Vermont 05673
802-496-4004
bill@maclayarchitects.com
http://www.maclayarchitects.com
Maclay Architects specializes in ecological planning and architecture, healthy building design, micro-load and net zero building design and received the 2012 NESEA Zero Net Energy Building Award. The firm's project portfolio includes ten LEED Gold or Platinum certified buildings, and five net zero or net zero ready institutional and commercial projects. Bill Maclay and Maclay Architects authored a book titled: The New Net Zero: Leading-Edge Design and Construction of Homes and Buildings for a Renewable Energy Future, by Chelsea Green Publishing. Bill Maclay, AIA, LEED-AP, and founding principal of Maclay Architects, has been recognized as a leader in innovative, healthy, and ecological planning and architectural design since 1971.
Specialties: *Architecture, Building Design & Construction, Commercial & Institutional, Education, Energy Conservation, Envelope & Enclosure, Multifamily, Net Zero Energy, Remodeling/DER, Single Family*

Maple Hill Architects
55 Glezen Ln.
Wayland, Massachusetts 01778
508-358-1615
doug@maplehillarchitects.com
http://www.maplehillarchitects.com
Maple Hill Architects is a full service design firm specializing in green design work in a variety of project types including educational, religious, and residential.
Specialties: *Building Design & Construction*

Maryann Thompson Architects
741 Mt. Auburn St.
Watertown, Massachusetts 02472
617-744-5187
maryann@maryannthompson.com
http://www.maryannthompson.com
Maryann Thompson Architects is a Cambridge-based architecture firm that offers a wide range of services to public and private clients. We specialize in architecture that is sustainable, regionally driven and that attempts to heighten the phenomenological qualities of the site in which we work. Our architectural investigations revolve around such concerns as the creation of a rich and thoughtful edge between inside and outside, utilizing light as a medium, and employing warm, natural materials in order to accentuate a sense of place. The firm's staff of 15 comes from diverse backgrounds, including architecture, landscape architecture, green architecture, planning, interior design and the visual arts.
Specialties: *Architecture, Landscape Design*

Mason Library, Keene State College
229 Main St., PO Box 3201
Keene, New Hampshire 03435
603-358-2711
hilary.croteau@keene.edu
http://www.keene.edu/academics/library
Specialties: *Education*

Massachusetts Audubon Society
208 South Great Rd.
Lincoln, Massachusetts 01773
781-259-2112
bpoor@massaudubon.org
http://www.massaudubon.org
Mass Audubon works to protect the nature of Massachusetts for people and wildlife. Together with more than 100,000 members, we care for 35,000 acres of conservation land, provide school, camp, and other educational programs for 225,000 children and adults annually, and advocate for sound environmental policies at local, state, and federal levels. Founded in 1896 by two inspirational women who were committed to the protection of birds, Mass Audubon is now one of the largest and most prominent conservation organizations in New England. Today we are respected for our sound science, successful advocacy, and innovative approaches to connecting people and nature.
Specialties: *Consumer Information, Education, Public Policy*

Massachusetts Clean Energy Center (MassCEC)
63 Franklin St., 3rd Fl.
Boston, Massachusetts 02110
617-315-9355
info@masscec.com
http://www.masscec.com
The Massachusetts Clean Energy Center (MassCEC) is dedicated to accelerating the success of clean energy technologies, companies, and projects in Massachusetts - while creating high-quality jobs and long-term economic growth for the people of Massachusetts.
Specialties: *Consumer Information, Education, Energy Conservation, Public Policy*

McCauley Lyman, LLC
10 Speen St., 3rd Fl.
Framingham, Massachusetts 01701
508-665-5801
inquiries@mccauleylyman.com
http://www.mccauleylyman.com
McCauley Lyman advises people about energy and business law and represents them in business-related transactions. We have a particular focus on the energy industry, including energy regulatory agencies, and have done a great deal of work with all aspects of developing, financing, and operating independent energy projects. We help people negotiate letters of intent and contracts, arrange financings, buy and sell businesses and their assets, resolve disputes, and do the myriad of other things business people (and government officials who deal with business people) need to get done in order to accomplish their business objectives.
Specialties: *Consultancy, Public Policy*

Menck Windows
77 Champion Dr.
Chicopee, Massachusetts 01020
508-509-3140
alanwall@menckwindows.com
http://www.menckwindows.com
Menck Windows: German Window Engineering now in America! This year, the U.S. will import over $150 million worth of windows to meet the increasing demand for energy-efficient building products. Because windows represent up to one-third of a building's energy-loss, architects and builders have increasingly turned to German manufacturers for technologically advanced and highly engineered windows and doors. Recognizing that the need for energy-efficient, environmentally friendly, and competitively priced windows will continue to grow, Menck Windows USA is building a new manufacturing facility in the United States. The new U.S. operation will produce windows and doors to the exacting specifications found at Menck-Fenster's production facility in Schwerin, Germany.
Specialties: *Windows*

Mindel and Morse Builders, LLC
PO Box 643
Brattleboro, Vermont 05302
802-254-6662
smmindel@gmail.com
http://www.mindelandmorse.com
We are a collection of builders focused on ensuring that homes operate efficiently and responsibly. Our focus is on residential, new construction of custom, energy efficient homes, renovations and additions
Specialties: *Building Design & Construction, Net Zero Energy, Passive Housing, Remodeling/DER, Single Family*

Mitsubishi Electric Heating & Cooling
150 Cordaville Rd.
Southborough, Massachusetts 01772
978-988-5771
mbrigham@hvac.mea.com
http://www.mitsubishielectric-usa.com
For more than 90 years, Mitsubishi Electric has made changes for the better through its energy-efficient products and technologies. These include factory automation equipment, automotive equipment, escalators, elevators, heating and cooling products, commercial hand dryers, large-scale video displays for stadiums and arenas, uninterruptible power supplies, solar panels, semiconductors, display walls, photographic and thermal printers, and electric utility products.
Specialties: *HVAC, Mechanical Systems & Lighting, Energy Conservation*

Mulberry Tree Builders, LLC
24 Old Amherst Rd.
Mont Vernon, New Hampshire 03057
603-801-6938
mulberrytreebuilders@gmail.com
http://www.mulberrytreebuilders.com
Mulberry Tree Builders has been a leader in high performance architectural design and construction since 1981. We achieved Passivhaus infiltration standards in 1988, in a modest Cape in Standish, Maine, employing Canadian Double Walled building techniques. We are now one of 150 firms in the US to have earned Passive House Certified Builders status. We are currently working closely w/ some of the top building science firms in the Northeast,in an effort to build on these early ground breaking accomplishments. Our hope is to collaborate w/ our clients to construct attractive, comfortable and environmentally resilient homes and business venues in Southern NH, Northeastern Mass, Greater Portland, and the Hallowell/Augusta, areas of Maine.
Specialties: *Building Design & Construction, Consultancy, Remodeling/DER*

N

National Grid
939 Southbridge St.
Worcester, Massachusetts 01610
315-481-4285
benjamin.veri@nationalgrid.com
http://www.nationalgridus.com
We serve a total of 1.2 million customers in 168 Massachusetts communities and are an electricity distribution subsidiary of National Grid. We contribute to the quality of life in communities across the Northeast. Care for the environment is integrated into everything we do.
Specialties: *Energy Conservation*

Navitus Strategies
1577 Franklyn Dr.
Furlong, Pennsylvania 18925
267-614-3145
bmagyar@navitusstrategies.com
http://www.navitusstrategies.com
Robert P. (Bob) Magyar is the Managing Director of Navitus Strategies, a professional services provider in the area of renewable energy revenue obtainment. He provides business development consulting services for energy efficiency and alternative energy technology development and market acceptance to major U.S. corporations, municipal governments and non-profits. He has worked with Shell Oil, BP Solar, American Standard, VARTA Storage GmbH, VARTA Microbattery Inc. USA, the Delaware Nation and U.S. Departments of Energy and U.S. Department of the Interior Bureau of Indian Affairs, among others.
Specialties: *Consultancy, Finance/CPA, Money & Business, Renewables & The Grid*

Neighborhood Housing Services of New Haven, Inc.
333 Sherman Ave.
New Haven, Connecticut 06511
203-562-0598
kfay@nhsofnewhaven.org
http://www.nhsofnewhaven.org
Neighborhood Housing Services of New Haven was incorporated in 1979 with a mission to revitalize selected neighborhoods in New Haven. Over time, our mission has evolved to focus on positioning New Haven's neighborhoods to succeed by increasing homeownership; making homes beautiful, energy-efficient, and affordable; and helping residents take charge of their neighborhoods. We believe that increased owner-occupancy rates, educated homebuyers, and rehabilitated houses will produce stable, revitalized neighborhoods that our clients will be proud to call home. During the course of our 35-year history, NHS has fully renovated and sold nearly 450 units to low- and moderate-income families.
Specialties: *Social Services, Remodeling/DER*

Net Zero Builders
36 Wildberry Ln.
Turner, Maine 04282
207-713-9090
steve@stevescustomhomes.com
http://netzero.builders
There are many builders, developers and designers who sell similar concepts and brands. Our Company has a long history and background in the modular industry. We have taken what we have learned over the last 25+ years about the modular home manufacturing industry to the next level. As a group we have spent a long time strongly focusing on what drives the building cost/cost per square foot and have learned how to control it. We then developed a system that stream lines the very labor intensive building process while still providing a high level of custom finishes and options. Our system applies to stick built, post frame and modular construction projects.

New Ecology, Inc.
15 Court Sq., Ste. 420
Boston, Massachusetts 02108
617-557-1700
info@newecology.org
http://www.newecology.org
The mission of New Ecology, Inc. is to catalyze sustainable development and bring its benefits to under-served populations, and to maintain a focus on acting locally to address global environmental issues. We work in many areas of community-based sustainable development, but we devote most of our efforts to green affordable housing. Our focus is on the practical and cost-effective: making new and existing buildings efficient, durable, and healthy.
Specialties: *Building Design & Construction, Certifications & Standards, Construction Process, Consultancy, Design Process, Education, Energy Auditing, Energy Conservation, Engineering, Envelope & Enclosure, Multifamily, Passive Housing*

New Energy Works Timberframers & Pioneer Millworks
1180 Commercial Dr.
Farmington, New York 14425
800.486.0661
joinery@newenergyworks.com
http://www.newenergyworks.com
Nearly three decades ago we started New Energy Works Timberframing, a small timber frame company. Today, along with our sister company Pioneer Millworks, we employ nearly 100 designers, timberwrights, engineers, craftspeople, and community members.

Together, we design and build some of the most lyrical and efficient timber frames in the industry, using reclaimed timbers, environmentally responsible practices, and state-of-the-art technology and software.

New Frameworks Natural Building, LLC
1 Mill St., Ste. 163
Burlington, Vermont 05404
802-917-4059
info@newframeworks.com
http://www.newframeworks.com
New Frameworks Natural Design/Build is a full-service contracting, consultation, and education company specializing in the integration of natural materials and technologies, and high-performance building systems. We are passionate about working in healthy environments and creating positive relationships to build structures that are truly sustainable. We enjoy working directly alongside clients in both design and construction, and firmly believe in the importance of social justice and skills access to enable people of all creeds and economic backgrounds access to safe, beautiful, and affordable shelter.
Specialties: *Building Design & Construction, Construction Process*

Next Phase Studios, Inc.
344 Boylston St.
Boston, Massachusetts 02116
617-375-9300
info@nps-architects.com
http://www.nps-architects.com
Next Phase Studios Architects is a collaborative design firm providing full design services for architecture and interiors. We work as an experienced, integrated team and use a dynamic, problem solving approach. As both individuals, and studio members, we strive for a very high level of expertise and effectiveness. This method leads to creative, sustainable, innovative design, building technology, and well managed Project Delivery.
Specialties: *Architecture*

Noble Home, LLC
PO Box 476
Shelburne Falls, Massachusetts 01370
413-623-3733
info@noble-home.net
http://www.noble-home.net
The modern, all natural, affordable home. The Noble Home is a house kit designed for each building site, easily assembled by an owner-builder.
Specialties: *Alternative Energy, Beyond Energy, Building Design & Construction, Design Process, Research, Single Family*

North By East Building Company
PO Box 4521
Portland, Maine 04112
207-420-1525
connect@northbyeast.me
http://www.northbyeast.me
We are a full service building firm providing Southern Maine (and beyond) with a range of smart building solutions for residential and light commercial projects. We combine unparalleled craftsmanship with a systematic approach to budgeting and scheduling. Our goal is to provide clients with a refreshing design/build experience characterized by excellent client communication, punctuality, reliability, and professionalism. We have tremendous respect for our coastal Maine environment and are proud to implement sustainable building practices and to use quality, locally sourced materials whenever possible.
Specialties: *Building Design & Construction, Construction Process, Design Process, The Big Picture*

Northeast Sustainable Energy Association (NESEA)
50 Miles St.
Greenfield, Massachusetts 01301
413-774-6051
nesea@nesea.org
http://nesea.org
Founded in 1974, the Northeast Sustainable Energy Association (NESEA) is today the region's leading membership organization promoting sustainable energy practices in the built environment.

Northern Manhattan Improvement Corporation (NMIC)
45 Wadsworth Ave., 8th Fl.
New York, New York 10033
212-822-8300
danrieber@nmic.org
http://www.nmic.org
NMIC has been providing Weatherization Services for over 30 years. If you have a multi-family building in Manhattan we can help you reduce your heating/hot water costs. We have helped dozens of buildings save as much as 35%. NMIC is BPI certified with cumulative staff experience of over 100 years in the energy conservation and retrofit industry.
Specialties: *Energy Auditing, Energy Conservation, HVAC, Mechanical Systems & Lighting, Multifamily, Single Family*

O

October Engineering, LLC
16 October Rd.
Sudbury, Massachusetts 01776
508-561-7553
rlm@octoberengineering.com
http://www.octoberengineering.com
October Engineering offers project development services for energy service performance contracts (ESPC), energy management systems (EMS) design and specification, heating, ventilating and air conditioning (HVAC) energy analysis and design and residential HVAC design. See our website.
Specialties: *Alternative Energy, Energy Auditing, Engineering, HVAC, Net Zero Energy, Remodeling/DER*

P

Partners For Architecture, Inc.
48 Union St., Bldg. 1
Stamford, Connecticut 06906
203-708-0047
studio@pfarch.net
http://www.pfarch.net
After a combined 75 years of working for many successful organizations, Partners For Architecture Inc. was inaugurated in 1999 with the dedication to establish an architectural firm that provides comprehensive and environmentally sensitive architectural services.
Specialties: *Architecture, Building Design & Construction, Energy Conservation*

passivhausMAINE
139 South Freeport Rd.
Freeport, Maine 04032
207-710-9478
ncobphoto@me.com
http://www.passivhausmaine.org
We build and design extremely energy efficient buildings. As a Certified Passive House Consultant we do energy calculations using the PHPP software.
Specialties: *Certifications & Standards, Multifamily, Passive Housing, Single Family*

Pavers By Ideal
45 Power Rd., PO Box 747
Westford, Massachusetts 01886
978-692-3076
info@idealconcreteblock.com
http://www.idealconcreteblock.com
Ideal manufactures a full line of interlocking concrete pavers and retaining wall systems. Products include Eco-Stone, Aqua-Bric, and Turfstone, environmentally friendly, permeable pavers. Pavers by Ideal offers a GREEN solution.
Specialties: *Landscape Design, Pavement*

Pella Windows and Doors
240 Mohawk Trl.
Greenfield, Massachusetts 01301
978-373-2500
mannimn@pellaboston.com
http://www.pella.com
Pella has a proud 90-year history of environmental stewardship and has been recognized for its energy efficiency leadership and sustainable business practices. You can feel good about choosing Pella windows and doors.
Specialties: *Windows*

Performance Building Supply
111 Fox St.
Portland, Maine 04101
207-780-1500
info@performancebuildingsupply.com
http://www.performancebuildingsupply.com
Performance Building Supply provides construction products and information to make buildings high performing, energy efficient, durable, resilient, healthy, and more comfortable for the occupants. Every product we offer is thoroughly researched and chosen based on energy performance, environmental, and health effects, manufacturing process and location, durability, and practical use.
Specialties: *Envelope & Enclosure, HVAC, Indoor Air Quality, Windows*

Petersen Engineering, Inc.
PO Box 4774
Portsmouth, New Hampshire 03802
603-436-4233
info@petersenengineering.com
http://www.petersenengineering.com
Petersen Engineering provides green consulting services in the areas of HVAC, plumbing, fire protection and building envelope for commercial, residential and industrial buildings.
Specialties: *Commercial & Institutional, Consultancy, Engineering, Envelope & Enclosure, HVAC, Multifamily, Single Family*

Peterson Engineering Group
25 Van Zant St., Ste. 7D
Norwalk, Connecticut 06855
203-810-4191
info@peg-eng.com
http://www.peg-eng.com
Peterson Engineering Group, LLC has been open since 2008. All employees have multiple years experience in consulting engineering for MEP & FP trades. The team has worked on projects from hotels to marinas & airports.
PEG takes part in the energy efficiency incentive program. PEG pays special attention to energy efficiency savings as well as operational & maintenance issues. PEG deals with these issues early in the design stage rather than at the end of the project to ensure a successful lifetime of the building. The principal of PEG is Mr. Donald C. Peterson, PE. He has been in the consulting engineering trade for the past twenty years. Mr. Peterson is a LEED AP with certifications in Energy Management, Commissioning & a Green Building Engineer on Department of Energy Star site.
Specialties: *Consultancy, Engineering*

Pill-Maharam Architects
53 Falls Rd., PO Box 1300
Shelburne, Vermont 05482
802-735-1286
dpill@pillmaharam.com
http://www.pillmaharam.com
Pill-Maharam Architects, founded in 1991 by David Pill offers comprehensive architectural services for institutional, commercial and residential clients. With hands on experience in the construction field, our staff brings to each project a realistic body of knowledge to create a buildable innovative solution. We are continually doing research into and incorporating sustainable strategies so that our finished projects are environmentally responsible. We fuse creative ideas with functional, budgetary and programmatic requirements to create finely detailed sculptural spaces and buildings.
Specialties: *Architecture, Building Design & Construction, Commercial & Institutional, Construction Process, Consultancy, Design Process, Electric/Hybrid Vehicles, Energy Conservation, Envelope & Enclosure, Geothermal, Mechanical Systems & Lighting, Net Zero Energy, Passive Housing, Photovoltaics, Single Family, Windows*

Placetailor, Inc.
51 Heath St.
Boston, Massachusetts 02130
617-639-0633
staff@placetailor.com
http://www.placetailor.com
Placetailor-made projects are always built to the highest efficiency possible with a particular eye toward comfort. Where a well placed window captures the sun's energy to heat a house, a heat recovery ventilator streams fresh winter air into a room without bringing in the winter temperature. We keep heat when we want it and get rid of it when we dont.
Specialties: *Building Design & Construction*

Preservation of Affordable Housing (POAH)
40 Court St., Ste. 700
Boston, Massachusetts 02108
617-261-9898
jklump@poah.org
http://www.poah.org
Preservation of Affordable Housing (POAH) is a nonprofit developer, owner and operator of nearly 9,000 affordable homes in 9 states and the District of Columbia. Our mission is to create, preserve and sustain affordable, healthy communities that provide economic security and access to opportunity for all people.
At POAH we recognize that managing the environmental footprint of our properties is a critical piece of our preservation mission. POAH has committed to both The Big Reach and Better Buildings Challenge, national programs with a target of reducing portfolio wide energy and water consumption but 20% by 2020. Our green initiatives weave throughout POAH activities and impact development, operations, and property management practices.
Specialties: *Building Design & Construction, Construction Process, Design Process, Energy Conservation, Envelope & Enclosure, Finance/CPA, Indoor Air Quality, Multifamily, Net Zero Energy, Real Estate, Social Services*

Project Planning and Management
224 Follen Rd.
Lexington, Massachusetts 02421
781-241-3189
paul@paulhlapointe.com
Plan and manage construction projects for environmentally conscious educational and cultural institutions; represent institutions throughout the project delivery process; assist institutions in selecting architects, consultants, and contractors.
Specialties: *Building Design & Construction*

PV Squared
311 Wells St., Ste. B
Greenfield, Massachusetts 01301
413-772-8788
info@pvsquared.coop
http://www.pvsquared.coop
PV Squared is proud to be one of the longest standing renewable energy specialists in the Pioneer Valley and Western New England. Since our founding in 2002, we have worked to deliver projects that go above and beyond, both in terms of energy production and financial performance, and in terms of thoughtfulness and attention to detail. Our structure as a worker-owned cooperative means we're able to offer the benefit of working with an owner of the business through every phase of your project, and that we're invested in the long term happiness of our clients, the livelihood of our workers, and the health of our community. Our customer-focused approach has built a reputation for quality and service that is second to none. If you're interested in talking solar, we'd love to hear from you.
Specialties: *Alternative Energy, Consultancy, Education, Net Zero Energy, Photovoltaics, Remodeling/DER, Renewables & The Grid, Roofing, The Big Picture, Electrical*

Q

Quigley Builders, Inc.
PO Box 2008
Ashfield, Massachusetts 01330
413-625-2301
maryquigley@quigleybuilders.com
http://www.quigleybuilders.com
Specialties: *Building Design & Construction*

R

R. L. Benton - Builder
154 Schoolhouse Rd.
Center Sandwich, New Hampshire 03227
603-284-6860
rlbentonbuilder@gmail.com
Full service builder/designer for energy-efficient residential construction in the NH lakes region. Timber-framing as well as advanced hybrid construction, with expertise in solar thermal system design and installation since 1978. Our Sandwich Cabinet Shop can furnish your project as well.
Specialties: *Building Design & Construction, Energy Conservation, Renewables & The Grid*

r3construction, Inc.
96 Upham St.
Melrose, Massachusetts 02176
781-844-2621
andrew@r3-inc.com
http://www.r3-inc.com
r3construction, inc. is a residential builder serving the Greater Boston area. We are a certified Passive House Builder with an in-house CPHC. We are passionate about re-establishing craft into the building process in service of resilient and efficient buildings.
Specialties: *Building Design & Construction, Envelope & Enclosure, Net Zero Energy, Passive Housing, Remodeling/DER, Single Family, Windows*

Ra Solar Company
PO Box 2222
Littleton, Massachusetts 01460
802-496-9496
yimbo98@gmavt.net
http://www.rasolar.ca
Builders of energy efficient, solar, green homes, additions & renovations since 1978. We can provide complete design/build services to our clients. We also offer green project consulting, plans modification, and specifications writing.
Specialties: *Alternative Energy, Building Design & Construction, Passive Housing*

Rachel Conly Design, LLC
26 Sterling St.
Peaks Island, Maine 04108
207-766-5625
rachelconlydesign@gmail.com
http://www.rachelconlydesign.com
We are a residential design group specializing in high performance buildings. We are dedicated to improving the health of our global home as we tend to the needs of individual homes. We believe in the interconnectivity of our planet and the sanctuary of a simple, safe and carefully crafted house. We are 8 years strong and growing, sharing our passion for beauty born in the balance of artistry, efficiency and care.
Specialties: *Architecture, Design Process, Envelope & Enclosure, Remodeling/DER, Single Family*

RBI Solar, Inc.
5513 Vine St.
Cincinnati, Ohio 45217
513-618-7214
hkaur@rbisolar.com
http://www.rbisolar.com
RBI Solar, Inc. is the leading turn-key supplier of solar mounting systems. As a specialist in ground mount, roof mount, landfill solar, and custom designed specialty solar structures, RBI Solar focuses on providing the most robust solar racking systems, installation services, and project management capabilities to serve owners and integrators. RBI Solar has engineers on staff licensed in all 50 states and offers complete design, high tech manufacturing, nationwide installation, and technical support to help solve the toughest challenges in the industry. Leveraging more than 80 years of experience in the commercial design-build specialty structures market, RBI Solar works with its clients to identify the most economical, durable and robust solution for solar installations.
Specialties: *Photovoltaics*

Reinsulation, Inc.
340 McKinstry Ave.
Chicopee, Massachusetts 01013
413-599-4884
reinsulation@gmail.com
http://www.reinsul.com
REinsulation reclaims useable rigid insulation boards from commercial flat roofs at our Chicopee, Massachusetts warehouse. The insulation is in usable condition at about half the price of new insulation. This combination results in equivalent thermal performance for 50% or more off cost of new insulation, or twice the thermal performance at cost similar to new. We also stock innovative rigid insulation products not available at lumberyards.
Specialties: *Building Design & Construction, Commercial & Institutional, Consultancy, Education, Energy Conservation, Envelope & Enclosure, Insulation*

Resilience Hub
224 Anderson St.
Portland, Maine 04101
207-370-7697
info@resiliencehub.org
http://resiliencehub.org
The Resilience Hub is a collaborative non-profit organization based in Portland Maine. Our mission is to build resilience at the personal, household and community levels while creating thriving examples of abundance based on ecological wisdom. We do this by offering a range of events, education and training as well as resilience-building services and projects. We operate at local, statewide and regional scales. Our work touches on all the realms traditionally encompassed by Permaculture (land use, energy, water, buildings, etc.) but with special focus on food and creating new economic models.
Specialties: *Education, The Big Picture*

Retrotec, Inc.
1060 East Pole Rd.
Everson, Washington 98247
604-732-0142
jwest@retrotec.com
http://www.retrotec.com
Retrotec is the world's leading manufacturer of building diagnostic tools. They make blower doors, duct testers, digital manometers, and air leakage testing software. Retrotec promotes green building through air tightness and enclosure integrity testing with equipment, software & training.
Specialties: *Certifications & Standards, Consultancy, Energy Auditing, Envelope & Enclosure, Home Inspection, HVAC, Indoor Air Quality, Insulation, Mechanical Systems & Lighting, Multifamily, Passive Housing, Research, Single Family, The Big Picture, Windows*

RH Irving Homebuilders
543 West Salisbury Rd.
Salisbury, New Hampshire 03268
603-344-6488
bob@rhirvinghomebuilders.com
http://www.rhirvinghomebuilders.com
Building fossil fuel free high performance homes with constant fresh air supply for excellent air quality and low energy bills. BrightBuilt Modular Homes. Custom Net Zero Energy Homes. Custom Passive House Homes, Certified or Non-Certified. Deep Energy Retrofits for existing homes. Design-build; on site or modular. Certified Passive House Consultant.
Specialties: *Building Design & Construction, Remodeling/DER*

Rhode Island Commerce Corporation
315 Iron Horse Way, Ste. 101
Providence, Rhode Island 02908
401-278-9100
ref@commerceri.com
http://www.commerceri.com
The Commerce RI Renewable Energy Fund (REF) is dedicated to increasing the role of renewable energy throughout the state. The REF provides grants and loans for renewable energy projects with the potential to make electricity in a cleaner, more sustainable manner, while stimulating job growth in the green technology and energy sectors of Rhode Island's economy. Using funds from the 'system benefit charge' on electric bills and Alternative Compliance Payments, Commerce RI will fund renewable energy projects in small-scale solar, feasibility studies and commercial development.
Specialties: *Alternative Energy, Commercial & Institutional, Consumer Information, Education, Photovoltaics, Renewables & The Grid*

Richard Renner | Architects
35 Pleasant St.
Portland, Maine 04101
207-773-9699
info@rrennerarchitects.com
http://www.rrennerarchitects.com
Richard Renner | Architects, a full-service architectural firm with offices in Portland, Maine and Sherborn, Massachusetts, is a richly varied practice creating inspired places for living, working, and learning. Environmentally responsible design is a cornerstone of the practice, and for over a decade, the firm has expanded and refined the process of designing effective" green" buildings.
Specialties: *Alternative Energy, Architecture, Building Design & Construction, Cities & Communities, Commercial & Institutional, Design Process, Energy Conservation, Indoor Air Quality, Insulation, Multifamily, Net Zero Energy, Remodeling/DER, Single Family, The Big Picture*

Ridgeview Construction
132A North Rd., PO Box 185
Deerfield, New Hampshire 03037
603-303-7206
scarter@ridgeview-construction.com
http://www.greenbuildernh.com
The home-building industry is more dynamic than ever before. As our environmental consciousness grows, the protection of land and natural resources is a mounting public concern. How we build homes, with regards to location, design and choice of materials, is one of the most significant ways we impact our future. At Ridgeview, we offer a holistic, green approach to home building, harmonizing the intricate systems within the home and property to minimize the environmental impact and improve the overall efficiency and healthiness of a home. Best of all, we care about the bigger picture without comprising aesthetics or the needs of the present. Our award-winning custom design shows that our eye for detail extends through all aspects of the home-building process.
Specialties: *Building Design & Construction, Remodeling/DER*

Ridgewood Bushwick Senior Citizens Council (RBSCC)
555 Bushwick Ave.
Brooklyn, New York 11206
718-366-3800
rcassidy@rbscc.org
http://www.rbscc.org
RBSCC was an early adopter of green building and energy efficiency technologies in residential construction. From participating in NYSERDA's first pilot program for multi-family buildings in 2004 to the 2014 completion of the first 100% affordable multi-family passive house in the country, RBSCC has been a leader in the field of green development for over a decade.
Specialties: *Multifamily, Passive Housing, Social Services*

R.J. Aley Building Contractors, LLC
185 Wilton Rd.
Westport, Connecticut 06880
203-226-9933
jaley@rjaley.com
http://www.rjaley.com
We specialize in energy efficient home remodeling, green building & historic preservation. Our projects include additions, bathrooms, kitchens and whole house renovations that blend seamlessly with the architectural style & period details of your home while enhancing its energy efficiency, functionality and comfort. We pride ourselves on attention to detail, and re-enforce our commitment to high standards through ongoing education in energy efficiency and sustainable building materials and methods. We strive to establish a relationship with our clients based on trust and integrity. Whether an addition, historic renovation, energy efficiency improvements or new Energy Star home, we maintain the highest standards and see each project through, from inception to completion.
Specialties: *Alternative Energy, Building Design & Construction, Energy Conservation, Insulation, Remodeling/DER, Single Family*

RLE Industries
35 Kulick Rd.
Fairfield, New Jersey 07004
973-276-0667
skoenig@rleindustries.com
http://www.rleindustries.com
RLE and our operating divisions Robert Lighting and Energy, and Lumenera make a full line of energy efficient fluorescent, HID and LED fixtures in standard and custom configurations. Our Energy Services division performs lighting retrofit services to business and industrial customers that can save up to 50% on energy costs.
As a legacy fixture manufacturer RLE and the knowledgeable people that serve our customers use its decades of experience to consistently make and develop durable, high quality fixtures that meet the objectives of their users. With hundreds of models and custom versions of standard products, RLE can meet any reasonable request. Special colors, wiring modifications and extreme applications can all be accommodated through the flexibility of our people and our processes.
Specialties: *Commercial & Institutional, Lighting Supply, Manufacturing, Remodeling/DER*

Rodman CPAs
51 Sawyer Rd., Ste. 610
Waltham, Massachusetts 02453
617-965-5959
info@rodmancpa.com
http://www.rodmancpa.com
Rodman CPAs provides tax advisory, accounting, and business strategy services to small and mid-sized emerging and established businesses. The firm combines the innovative and strategic approach associated with large accounting firms with the personal touch of a smaller CPA firm.
The firm works with clients across a range of industries, with a particular expertise in the clean energy sector. Rodman's "Green Team" are domain experts in alternative energy, offering tax advisory, financial, and accounting services and Investment Tax Credit (ITC) studies for cleantech companies involved in solar, wind, biomass, and energy efficiency projects.
Specialties: *Finance/CPA*

RST Thermal
372 University Ave.
Westwood, Massachusetts 02090
781-320-9910
mehickey@rstthermal.com
http://www.rstthermal.com
RST Thermal is a Manufacturer's Representatives in the New England area covering Eastern Massachusetts, New Hampshire, Maine, Connecticut, and Rhode Island for multiple leading manufacturers whose products offer a systems approach to comfortable heating and cooling. We provide technical and sales support to our wholesale distributor partners and contractors. For homeowners, we provide geographic lists of installing and servicing contractors to help them find the "best fit" for the project to be done.
Specialties: *Multifamily, Single Family, Mechanical Systems & Lighting, HVAC*

S

Sage Builders, LLC
672 Chestnut St.
Newton, Massachusetts 02468
617-965-5272
info@sagebuilders.com
http://www.sagebuilders.com
Award-winning, full service Boston area residential design-build company committed to responsible design and construction practices. Experts in energy efficiency and weatherization.
Specialties: *Building Design & Construction, Energy Conservation, Remodeling/DER*

Sandri Energy, LLC
400 Chapman St.
Greenfield, Massachusetts 01301
413-772-2121
jgoodyear@sandri.com
http://www.sandri.com/renewable-energy
Sandri is a full service energy provider for your home or business. We are family owned company that has been in business for 80 years. Our direct service area encompasses Western MA and Southern VT and NH. We wholesale our products throughout the North East.
Specialties: *Biomass, Photovoltaics, Solar Thermal*

Seed Systems
313 Farley Rd.
Wendell, Massachusetts 01379
joe@seedsystems.net
http://www.seedsystems.net
Seed Systems uses a systems-in-action approach while working with individuals, teams, organizations, and networks to transform organizations and create a sustainable world.Over nearly two decades, they have worked in business, non-profit, government and academic sectors; creating, designing, facilitating, teaching and coaching leadership programs and culture change initiatives all dedicated to creating a sustainable world. With Seed Systems as incubator for innovation, Sara and Joe were the co-creators of the SoL Sustainability Consortium in 1998, a network of companies and major corporations including Nike, Shell, Ford, WorldBank, Interface and many more, challenging each other to create best practices in the field.
Specialties: *Alternative Energy, Consultancy, Education*

Sellars Lathrop Architects, LLC
1 Kings Hwy. North
Westport, Connecticut 06880
203-222-0229
ann@sellarslathrop.com
http://www.sla-arch.com
Small, woman-owned firm designing upgrades, additions and renovations for 21st century living. Primary projects are residential and light commercial work in Fairfield County, CT., emphasizing energy efficiency and smart building technologies to create high quality solutions with character and style.
Specialties: *Building Design & Construction*

Siga Cover, Inc.
300 Irvine Spectrum Center Dr., Ste. 400
Irvine, California 92618
855-733-7442
james.drysdale@sigacover.com
http://www.sigacover.com
SIGA high-performance adhesives offer first-class quality. With the easy to apply SIGA system you create an air and windtight layer which offers you the best reliability and comfort for the entire lifespan of your house. You have our word!
Specialties: *Indoor Air Quality, Manufacturing, Windows*

Simpson, Gumpertz and Heger, Inc.
41 Seyon St., Bldg. 1, Ste. 500
Waltham, Massachusetts 02453
781-907-9000
info@sgh.com
http://www.sgh.com/
Simpson, Gumpertz & Heger Inc. (SGH) is a national engineering firm that designs, investigates, and rehabilitates structures, building enclosures, and materials. Our award-winning work encompasses building, energy, civil/infrastructure, and science/defense projects in the United States, Canada, and more than thirty additional countries.
Specialties: *Engineering*

SJP Environmental Consulting, LLC
PO Box 303
Montague, Massachusetts 01351
http://www.sjpconsulting.biz
Offering Pioneer Valley, MA, residents an unbiased, friendly perspective on energy saving and renewable energy options for their homes, helping them: explore & prioritize cost-effective measures for a cozier, healthier home with less wasted energy, understand renewable energy options like solar, tap incentives, and learn about financing for energy projects. I also provide clients with a list of vetted local energy contractors. For businesses & nonprofits, my services include: writing articles, press releases, grant proposals, and website text; managing and promoting projects; collaborating with organizations; and public education.
Specialties: *Alternative Energy, Composting, Consumer Information, Education, Energy Conservation, Single Family*

Smart Energy of New England, Inc.
PO Box 56
Colebrook, New Hampshire 03576
800-608-5840
catherine@smartenergyne.com
http://www.smartenergyne.com
Smart Energy of New England is a seven-year-old corporation located in Columbia, New Hampshire. We serve New Hampshire, Vermont and Maine as well as the Bahamas. We are an up-and-coming provider of energy efficient systems, both commercial and residential. Our main focus is on Solar Photovoltaic Systems and we are becoming well-known for our attention to detail and our satisfied-customer business model. We are currently increasing our presence in the international marketplace with new projects in the Bahamas and potential projects in Africa. Our mission is to introduce our customers to local natural resources to save them money while reducing our collective carbon footprint and decreasing our dependence on fossil fuels and imports.
Specialties: *Biomass, Photovoltaics, Solar Thermal, Wind*

Solablock
116 Pleasant St.
Easthampton, MA 01027
339-230-4600
pquinlan@solablock.com
http://www.solablock.com
SolaBlock LLC manufactures permanently PV-clad building materials, providing a cost-competitive solar solution to meet most of the electric load in a energy-efficient building.
Specialties: *Wind, Photovoltaics, Building Design & Construction*

Solar Store of Greenfield
2 Fiske Ave.
Greenfield, Massachusetts 01301
413-772-3122
claire@solarstoreofgreenfield.com
http://www.solarstoreofgreenfield.com
Local Western MA renewable energy consultants in a brick and mortar storefront. We provide Advice, Design, and Installation of Solar PV and Hot Water systems for residential and commercial settings. All projects are turnkey covering all permits, incentives, utility interconnection and SREC aggregation.
We also offer battery backup systems for grid and off-grid PV systems. Additionally, composting toilets, biodiesel, solar clothes drying racks, books and Eat More Kale t-shirts are available.
Tracking the SUN: Not Fracking Gas
Specialties: *Energy Conservation, Photovoltaics, Solar Thermal*

Solar Wave Energy, Inc.
31 Cambridge Ter.
Cambridge, Massachusetts 02140
617-242-2150
hkv@solarwave.com
http://www.solarwave.com
Solar Wave Energy has been installing and servicing solar energy systems since 1978. Today we provide controller integrated web-based monitoring for solar thermal (heating & hot water) systems allowing installers and building owners to oversee and manage their systems remotely.We currently have integrated performance monitoring for solar controllers including Resol, Caleffi, Stiebel Eltron, Viessmann and more. Call or see demo at www.solarwave.com.
Specialties: *Energy Auditing, Energy Conservation, Solar Thermal*

Solect Energy Development
89 Hayden Rowe St., Ste. E
Hopkinton, Massachusetts 01748
508-598-3511
info@solect.com
http://www.solect.com
Solect, Inc. is a solar renewable energy development company focused on the deployment of solar photovoltaic (PV) systems. Solect works with the appropriate financial partners to fund the deployment of solar renewable energy systems.
Specialties: *Photovoltaics*

South Mountain Company
15 Red Arrow Rd. PO Box 1260
West Tisbury, Massachusetts 02575
508-693-4850
jabrams@southmountain.com
http://www.southmountain.com
South Mountain Company, located on Martha's Vineyard, is a multi-faceted firm offering architecture, engineering, building, interiors, woodworking, and energy services.
Specialties: *Building Design & Construction, Energy Conservation, Photovoltaics*

Sparhawk Group
81 Bridge St., Ste. 107
Yarmouth, Maine 04096
207-846-7726
admin@sparhawkgroup.com
http://www.sparhawkgroup.com
From offices in New York City and Portland, Maine, we have driven energy efficiency into over 25,000 units of multifamily buildings, commissioned $900+ million in new construction and provided leadership in energy efficiency since 1990. Early in the company's history, Sparhawk Group began with pay-for-performance energy efficiency projects delivering 3.5 megawatts of electrical power conservation at industrial, institutional, commercial and government buildings. These projects were commissioned to ensure savings, and thus payments for performance, were realized. This grounding in energy performance and commissioning drives our company vision to this day.
Specialties: *Consultancy, Design Process, Energy Auditing, Engineering, Multifamily*

Spartan Solar
10 Charles St.
Greenfield, Massachusetts 01301
413-768-0095
gospartansolar@gmail.com
http://www.gospartansolar.com
We provide the highest quality solar hot water installations available utilizing both drain-back and pressurized designs. We take special care to integrate our systems seamlessly within the larger design of the building. In partnership with Turnkey Builders, we offer additional services including air source heat pump installation, HRV/ERV installation, and affordable triple pane windows. We designed and built the home that won the 2015 NESEA Net Zero Energy Building Award and are able to provide consulting services with a holistic approach.
Specialties: *Alternative Energy, Building Design & Construction, Consultancy, Energy Conservation, HVAC, Net Zero Energy, Renewables & The Grid, Solar Thermal, Windows*

Spirit Solar
PO Box 80007
Springfield, Massachusetts 01138
413-883-3144
info@spiritsolar.net
http://www.spiritsolar.net
Spirit Solar provides installation and service for all types of solar hot water systems, solar educational services, and third party PV system verification.
Specialties: *Consultancy, Education, Solar Thermal*

SPL Development Group
71 Deer Hill Cir.
Pelham, New Hampshire 03076
603-582-0151
spaquette@splllc.com
https://www.linkedin.com/company/spl-development-group-llc
Steve has over 28 years experience in real estate development, construction and property management. After earning a bachelor's degree in management in 1984, he began working in real estate development, acquiring development sites. He has been a registered Massachusetts Real Estate Broker since 1987. In 1988, Steve began developing multi-family apartment sites for SK Properties. During that time, he developed over 600 units of elderly and family properties in three New England States. He also developed and managed the build out of several single-family subdivisions, the latter of which was a 43-unit development in the southern part of Manchester, NH, Heritage Common, completed in 1997.
Specialties: *Building Design & Construction*

Steele Kellogg AIA
3 Walnut St.
Madison, New Jersey 07940
973-377-5757
steelekellogg@gmail.com
http://www.steelekellogg.com
We draw on an interdisciplinary team of design professionals to give you the highest level of expertise, concentrating on a small number of clients in order to bring each project the attention it deserves. Whether you are planning a new building, a renovation or an addition, for an imaginative and thoughtful review of your design needs, please contact us.
Specialties: *Architecture, Design Process*

Stephen Turner, Inc.
317 Hope St.
Providence, Rhode Island 02906
401-273-1935
info@sturnerinc.com
http://www.buildingcommissioning.com
Stephen Turner Inc. is dedicated to providing comprehensive commissioning services. Commissioning is a quality process which ensures, verifies, and documents that a completed project or existing building meets the owner's needs and expectations. Our firm provides commissioning services in all forms new building commissioning, renovation commissioning, retrocommissioning, ongoing commissioning of existing buildings, and commissioning of system retrofits.
Specialties: *Construction Process*

Steven Winter Associates, Inc.
307 7th Ave., Ste. 1701
New York, New York 10001
203-857-0200
tboles@swinter.com
http://www.swinter.com
Since 1972, SWA has provided services to improve commercial, multifamily, and residential buildings. We specialize in energy, sustainability, and accessibility consulting as well as certification, research, and compliance services.
Specialties: *Building Design & Construction, Certifications & Standards, Commercial & Institutional, Consultancy, Education, Energy Auditing, Engineering, Envelope & Enclosure, HVAC, Indoor Air Quality, Insulation, Marketing, Multifamily, Passive Housing, Photovoltaics, Research, Single Family*

Steveworks, LLC
108 Cabot St.
Newton, Massachusetts 02458
617-201-0121
steve@steveworks.com
http://www.steveworks.com
At Steveworks, we expect all our jobs to exemplify craftsmanship, durability, and value. These principles are important to the customers who frequently come back to us or pass us along to new clients, and they are the pillars of sustainable building. Being sustainable requires us to take into account energy performance, the sources and quantity of materials and resources, and how often those materials or other parts of your home will last. We believe quality craftsmanship, durability, value, and sustainability can all be implemented with a practical approach that will fit in any budget.
Specialties: *Remodeling/DER*

Stiebel Eltron, Inc.
17 West St.
West Hatfield, Massachusetts 01088
413-247-3380
bill.riley@stiebel-eltron-usa.com
http://www.stiebel-eltron-usa.com
Stiebel Eltron - German manufacturer energy saving Tempra Plus tankless electric (99% efficient) water heaters feature advanced flow control to automatically keep output temperature constant and provide unlimited hot water. Accelera 220E (58gal) & 300E (80gal) Heat Pump water heaters with electronic anodes, Energy Star rated with energy factors 220E (3.05EF), 300E (3.39EF), just 650W in HP mode & max 2150W incl back-up element, annual energy use 220E (1040 kWh/yr) 300E (1289 kWh/yr) as determined by DOE testing. Stiebel solar thermal systems present a great hedge against fossil fuel price volatility. Federal tax credits, often state and local incentives too, can cut installed cost by up to 40%.
Specialties: *Energy Conservation, Manufacturing, Solar Thermal*

SunBug Solar
1165 Mass Ave.
Arlington, Massachusetts 02476
617-500-3938
info@sunbugsolar.com
http://www.sunbugsolar.com
SunBug is a solar energy consulting and installation company with offices in sunny Arlington, Massachusetts. We are complete solar installers, offering site analysis, system design, rebate processing, and system monitoring.
Specialties: *Alternative Energy, Commercial & Institutional, Multifamily, Photovoltaics, Single Family, Solar Thermal*

Sustainable Business Network
2401 Walnut St., Ste. 206
Philadelphia, Pennsylvania 19103
215-963-2100
info@sbnphiladelphia.org
http://www.sbnphiladelphia.org
The mission of the Sustainable Business Network is to build a just, green, and thriving economy in the Greater Philadelphia region. We accomplish this by educating and growing a broad base of local, independent businesses and educating policymakers and the public.
Specialties: *Alternative Energy, Education, The Big Picture*

Sustainable Comfort, Inc.
146 Main St., Ste. 301
Worcester, Massachusetts 01608
508-713-6680
info@greenrater.com
http://www.greenrater.com
Sustainable Comfort, Inc. (SCI) is a green building and energy efficiency consulting firm with expertise in multifamily housing. SCI specializes in ENERGY Star Homes, LEED for Homes, Enterprise Green Communities, Passive House, HERS Rating, State Incentive Programs, and Code Compliance. We are also involved with the property management and development of multifamily buildings.
SCI is proficient in the affordable multifamily development process and helps you secure funding and project certifications. We help make it easy to navigate the many options to meet your green building and energy efficiency needs. Our team has over 20 years combined experience in the energy efficiency and green building consulting industry. We have certified over 3,000 units for various programs and certifications.
Specialties: *Certifications & Standards, Consultancy, Multifamily, Passive Housing*

Sustainable Energy Analytics
4 Militia Dr., Ste. 6
Lexington, Massachusetts 02421
781-652-8282
energystar@sea.us.com
http://www.sea.us.com
Sustainable Energy Analytics, LLC is dedicated to helping owners of all types of residential buildings (from single family to large multi-family, new and existing) maximize the value of their property by:
Reducing the energy consumption
Improving the building's durability and comfort
Providing a safe and healthy environment for the occupants
Identifying the most economical path, unbiased by product or technology loyalties.
Specialties: *Consultancy, Renewables & The Grid, Single Family*

SWZ Architects, LLC
1 Edgehill Rd.
Winchester, Massachusetts 01890
617-890-8907
shelly@swzarchitects.com
http://www.swzarchitects.com
SWZ Architects LLC offers a full range of architectural services for new construction and renovation for a wide range of clients. The firm is service minded and comfortable handling projects of various sizes and locations throughout the United States. We love what we do and value working with others who share our enthusiasm and outlook.
Specialties: *Architecture*

T

Taggart Construction, Inc.
10 South St.
Freeport, Maine 04032
207-865-2281
peter@tagcon.com
http://www.tagcon.com
Residential and commercial design/build construction company, emphasizing energy efficient, environment friendly and occupant healthy building solutions. Architectural services, construction management, value engineering, historic restoration and custom woodworking.
Specialties: *Building Design & Construction*

Thinklite, LLC
182 W. Central St., Ste. 201
Natick, Massachusetts 01760
617-500-6689
phil.bonomo@thinklite.com
http://www.thinklite.com
ThinkLite is a global lighting efficiency company that custom designs, manufactures, distributes, and installs energy efficient retrofit solutions to commercial customers and governments.
Our efficient lighting products leverage proprietary LED and Induction technologies that specifically adapt to existing infrastructures. We are headquartered in Natick, Massachusetts with operations in over 14 countries.
Specialties: *Lighting Supply, Manufacturing*

Thompson Johnson Woodworks
115 Island Ave.
Peaks Island, Maine 04108
207-653-1392
heather@tjwhome.com
http://www.tjwhome.com
Residential building and renovations in the Greater Portland Maine area. We employ best building practices in all aspects of each of our projects. We strive to incorporate highly efficient/green building standards and materials to the maximum extent possible on each of our projects.
Specialties: *Building Design & Construction, Remodeling/DER*

Thornton Tomasetti, Inc.
386 Fore St., Suite 401
Portland, Maine 04101
207-347-5066
vgooje@thorntontomasetti.com
http://www.thorntontomasetti.com
Thornton Tomasetti performs whole-building energy analysis and modeling throughout design and into occupancy to predict and measure operational performance. Advanced analytical tools allow us to offer data-driven strategies to maximize energy savings, increase occupant comfort, reduce carbon footprint and effectively incorporate renewable energy strategies. Our multidisciplinary staff consults on green building certifications including, but not limited to, LEED and Passive House. Our services range from complete administration to special calculations, simulations and services geared toward individual credit requirements.
Specialties: *Alternative Energy, Certifications & Standards, Commercial & Institutional, Construction Process, Consultancy, Education, Energy Auditing, Energy Conservation, Engineering, Envelope & Enclosure, Multifamily, Net Zero Energy, Passive Housing, Photovoltaics, Renewables & The Grid, The Big Picture*

Thoughtforms Corporation
543 Massachusetts Ave.
Acton, Massachusetts 01720
978-263-6019
mark@thoughtforms-corp.com
http://www.thoughtforms-corp.com
Thoughtforms Corporation specializes in building high-end custom homes and unique institutional buildings in eastern Massachusetts.
Specialties: *Building Design & Construction*

TimberHomes Vermont
6335 VT Rte. 113
Vershire, Vermont 05079
802-685-7974
info@timberhomesllc.com
http://timberhomesllc.com
We specialize in designing and building natural, soulful, resilient and energy efficient homes. Timber Frames. Tree forms. Scribe work. Vermont materials. Net zero homes. Timber framed solar pavilions. Barns & outdoor structures. Spiral stairs & compound roofs.
Specialties: *Building Design & Construction, Construction Process, Education, Net Zero Energy*

Timeless Architecture
147 School St.
Milton, Massachusetts 02186
617-696-6448
hmaclean@timearch.com
http://www.timearch.com
Mr. MacLean is an Architect, Educator and licensed Builder who began his career as a Project Manager with a number of large Architectural firms in Boston before he started his own firm, Timeless Architecture in 1988. He has been promoting and teaching Green Design for 25 years, starting with the Boston Society of Architects, where he served as co-chair of the Committee on the Environment (COTE), a sub-committee of the BSA that promotes sustainable design in the New England Region. He has taught and developed ongoing curricula at the Boston Architectural College, Sustainable Design Institute and Master's program.
Specialties: *Building Design & Construction, Energy Conservation, Remodeling/DER*

Total Green Energy Solution, LLC
329 Massachusetts Ave.
Lexington, Massachusetts 02420
781-357-2454
info@mytotalgreen.com
http://www.mytotalgreen.com
Total Green Energy Solution is your Energy Efficiency Consultant and RESNET-certified HERS Rater. Expertise in energy efficiency/3D modeling, building science/diagnosis and optimization helps us maximize home energy performance while lowering your construction cost. We help Greater Boston builders, architects, and homeowners with their Stretch Code and ENERGY STAR projects while enhancing comfort and protecting the Earth.
Specialties: *Building Design & Construction, Construction Process, Consultancy, Design Process, Energy Auditing, Energy Conservation, Engineering, Envelope & Enclosure, Indoor Air Quality, Insulation, Research*

Trillium Architects, LLC
409 Main St., Ste. 14
Ridgefield, Connecticut 06877
203-438-4540
trilliumarchitects@gmail.com
http://www.trilliumarchitects.com
We are a women owned and operated full service architecture and design firm. At Trillium we design intelligent quality architecture and we endeavor to cultivate beauty and delight. We are trained in and highly aware of aesthetics and the human spatial experience. We believe in designing houses that you would be proud to leave your grandchildren. As unique as the people who occupy them; as beautiful as the natural world that surrounds them.
Specialties: *Architecture, Building Design & Construction, Single Family*

Truth Box, Inc.
460 Harris Ave., Unit 104
Providence, Rhode Island 02909
401-453-1300
pgc@truthbox.com
http://www.truthbox.com
We offer cost effective architectural solutions that help the environment and enhance design and comfort. Truth Box also offers consultation on building development and can be a versatile partner in small to mid-sized projects that generate value from thoughtful design, high energy-efficiency and affordable construction practices.
Specialties: *Architecture, Building Design & Construction, Energy Conservation, Multifamily, Net Zero Energy, Real Estate*

Turn Key Builders, Inc.
410 Chapman St.
Greenfield, Massachusetts 01301
413-774-9946
turnkeybuild@gmail.com
http://www.turnkeybuilders.net
Quality super insulated homes, additions and photovoltaic installs. Member Home Builders and Remodelers of Western Ma, Energy Star Building Partner.
Specialties: *Building Design & Construction, Photovoltaics, Remodeling/DER*

U

Uncarved Block, Inc.
78 Carter Rd.
Becket, Massachusetts 01223
413-464-2598
brad@uncarvedblockinc.com
http://www.uncarvedblockinc.com
Uncarved Block is a design/build organization that combines historic building techniques with modern technology and an eye towards the artistic. We specialize in energy efficient structures primarily built with local wood and stone.
Specialties: *Building Design & Construction, Remodeling/DER*

United Illuminating Company
157 Church St., PO Box 1564
New Haven, Connecticut 06510
203-499-2923
patrick.burns@uinet.com
http://www.uinet.com
The United Illuminating Company (UI), Southern Connecticut Gas Company (SCG) and the Connecticut Natural Gas Company (CNG) are administrators of the Residential and Commercial
Industrial energy efficiency programs through the Energize Connecticut initiative. Energize Connecticut (SM) is an initiative dedicated to empowering Connecticut citizens to make smart energy choices, now and in the future. We provide Connecticut consumers, businesses and communities the resources and information they need to make it easy to save energy and build a clean energy future for everyone in the state. Energize Connecticut helps you save money and use clean energy.
Specialties: *Building Design & Construction, Energy Auditing, Energy Conservation*

Urban Grid
337 Log Canoe Cir.
Stevensville, Maryland 21666
410-604-3603
info@urbangridco.com
http://www.urbangridco.com
Urban Grid specializes in the turnkey development and finance of solar photovoltaic projects (500kW to 5MW) throughout the United States. Urban Grid's 20-25 year Power Purchase Agreements (PPAs) are designed to generate consistent operating performance and predictable economic benefit for our clients. The Urban Grid team brings together seasoned finance and construction professionals to provide the highest quality solar installation and offer the best financial solution for commercial, educational, government and non-profit organizations.
Specialties: *Alternative Energy, Finance/CPA, Photovoltaics, Renewables & The Grid*

Urban Habitat Initiatives, Inc.
328A Tremont Street
Boston , Massachusetts 02116
Phone: 617-423-5566
kim.vermeer@urbanhabitatinitiatives.com
https://www.linkedin.com/in/kimberlyvermeer
Urban Habitat Initiatives Inc. is a leading independent consulting firm focused on advancing sustainability in multifamily housing. We offer green project management services to owners and developers from early strategies through development and construction to measuring results. Kim Vermeer, President, is a frequent speaker, educator, and author
Specialties: *Consultancy, Multifamily*

USL Technology, Inc.
157 Columbus Ave.
New York, New York 10023
866-761-0940
info@uslitechnology.com
http://www.uslitechnology.com
USL Technology is a Technology Strategy, Energy Management and Sustainability Consulting firm. We support our clients by providing professional services that help them become more energy efficient; improve the performance of their assets, reducing costs and carbon emissions. Our expanded portfolio is based on the integration of IT Network Infrastructure Implementation and EnergyWise technology systems. Headquartered in New York City, we work with businesses throughout the five boroughs.
Specialties: *Alternative Energy, Beyond Energy, Building Design & Construction, Certifications & Standards, Commercial & Institutional, Consultancy, Design Process, Energy Auditing, Energy Conservation, Engineering, HVAC, Indoor Air Quality, Insulation, Mechanical Systems & Lighting, Net Zero Energy, Real Estate, Renewables & The Grid*

V

Valle Group
70 East Falmouth Hwy., Ste. 3
East Falmouth, Massachusetts 02536
508-548-1450
info@vallegroup.com
http://www.vallegroup.com
The Valle Group sets the standard for thoughtfully-planned communities in southern New England. The company's special expertise is planning and creating communities of quality, energy-efficient homes, and building and remodeling for homeowners.
Specialties: *Building Design & Construction, Remodeling/DER*

Valley Home Improvement
340 Riverside Dr.
Northampton, Massachusetts 01062
413-584-7522
info@valleyhomeimprovement.com
http://www.valleyhomeimprovement.com
Valley Home Improvement is a 3 tiered residential design/build remodeling company serving the Pioneer Valley for more then two decades. In conjunction with our full service remodeling work, Valley Solar offers PV design and installation, and our Weatherization division implements a wide range of energy conservation measures.
Specialties: *Building Design & Construction, Design Process, Insulation, Photovoltaics, Remodeling/DER, Renewables & The Grid, Single Family*

Venbrook Insurance Services
4 Abbott Ave.
Ridgefield, Connecticut 06877
914-649-0007
rfreeman@venbrook.com
http://www.venbrook.com
Delivering awesome solar, geothermal, energy warranty and commercial real estate insurance solutions to the northeast green building market.
Specialties: *Insurance*

Viessmann Manufacturing Company, Inc. (US)
45 Access Rd.
Warwick, Rhode Island 02886
401-732-0667
full@viessmann.com
http://www.viessmann.us
The same expertise and innovation that has made Viessmann the best-selling brand of floor-mounted boilers in Europe is also evident in North America. The Viessmann USA Head Office has been located in Warwick, RI since 1991. In 2003 the company relocated to a new 38,000 square foot, state-of-the-art facility to extend its distribution network and to strengthen the company's logistical capacity.
Specialties: *Biomass, Solar Thermal, HVAC, Mechanical Systems & Lighting*

W

Wagner Development
161 Westview Rd.
Lowell, Massachusetts 01851
508-451-3202
ryan@wagnerdevelopment.org
http://www.wagnerdevelopment.org
At Wagner Development, we are focused on developing a name you can trust. A WD house, regardless of location, size, and style, will be built to last using quality materials and expert craftsmanship. Our goal at WD is to build a reputable name that will invoke trust among our customers. That is WD.
Specialties: *Construction Process, Net Zero Energy, Passive Housing, Remodeling/DER, Single Family*

Walker Cellar Works
27 Aldworth Rd.
Harrisville, New Hampshire 03450
603-827-9999
walkerdb.doug@gmail.com
http://www.walkercellarworks.com
Does your home have "cold, wet feet?" Walker Cellar Works uses a "whole house" systems approach to analyze your water and moisture control issues. Using the latest in building science, we solve these problems and make your home healthy, warm, and comfortable.
Specialties: *Building Design & Construction, Construction Process, Energy Auditing, Remodeling/DER, Single Family*

Warren Design Build
268 West St.
Berlin, Massachusetts 01503
978-621-7619
carl@warrendesign.com
http://www.warrendesign.com
Over 30 years experience using current building science techniques to design and build durable, low maintenance, healthy, low-impact homes. Check us out at warrendesign.com
Specialties: *Building Design & Construction*

Water Energy Distributors
2 Starwood Dr.
Hampstead, New Hampshire 03841
603-329-8122
christina@northeastgeo.com
http://www.northeastgeo.com
Geothermal design & geothermal heat pump distribution for the Northeastern United States since 1978.
Specialties: *Energy Conservation, Geothermal, HVAC, Mechanical Systems & Lighting*

Weedon Design Build
24 Tull Ln.
Pomfret Center, Connecticut 06259
860-974-2362
cweedon24@gmail.com
Over 30 years of experience in helping people design and build superinsulated homes and small offices. Certified passive house consultant.
Specialties: *Building Design & Construction*

WegoWise, Inc.
20 Ashburton Pl., Ste. 401
Boston, Massachusetts 02108
617-367-9346
info@wegowise.com
http://www.wegowise.com
WegoWise's intuitive software provides timely, insightful, and actionable information to understand, track, and improve building efficiency.

Our solutions, which include automated utility tracking and benchmarking, tech-driven energy procurement, energy disclosure policy compliance, and utility allowance services, empower customers to manage energy and water usage, as well as save time and money.
Specialties: *Alternative Energy, Cities & Communities, Commercial & Institutional, Consumer Information, Multifamily, Public Policy, Real Estate, Renewables & The Grid, The Big Picture, Information Technology*

Wesson Energy, Inc.
PO Box 2127
Waterbury, Connecticut 06722
203-756-7041
wwesson@wessonenergy.com
http://www.wessonenergy.com
Wesson Energy is a progressive energy partner specializing in modern, high-efficiency solutions and comprehensive home comfort service. We help homeowners and businesses integrate alternative energy sources, including solar and biofuel.
Specialties: *Multifamily, Single Family, Mechanical Systems & Lighting, HVAC*

West Hill Energy And Computing
205 Main St., Ste. 14
Brattleboro, Vermont 05301
802-246-1212
al@westhillenergy.com
http://www.westhillenergy.com
Data Evaluation and Insight. Specializing in the evaluation and statistical analysis of energy efficiency programs.
Specialties: *Energy Auditing*

Wolfworks, Inc.
195 West Main St., Ste. K
Avon, Connecticut 06001
860-676-9238
info@homesthatfit.com
http://www.homesthatfit.com
We are guides.

We guide a process for clients who are prepared to design and build collaboratively and responsibly.

Together we create spaces that look great, work well, and feel good to be in.
Specialties: *Building Design & Construction, Remodeling/DER*

Wright Builders, Inc.
48 Bates St.
Northampton, Massachusetts 01060
413-586-8287
info@wright-builders.com
http://www.wright-builders.com
Wright Builders, Inc. is a leading construction firm in the Pioneer Valley area, known for their creativity and ingenuity, striving for the highest quality and enduring value on every project. Committed to sustainable construction, utilizing the guidelines for Energy Star and LEED Certification standards, all buildings are designed and constructed to protect and promote the health and wellness of its occupants, while reducing the overall impact of the construction on the environment.
Currently construction managers for two Living Building Challenge (LBC) buildings in Amherst, MA, Wright Builders strives to remain at the forefront of utilizing evolving green and sustainable construction techniques.
Specialties: *Building Design & Construction, Commercial & Institutional, Construction Process, Design Process, Net Zero Energy, Passive Housing, Remodeling/DER, Single Family*

Y

Yankee Thermal Imaging
75 Allen St.
Rochester, New Hampshire 03867
603-330-3377
tim.gill@yti.biz
http://www.yankeethermalimaging.com
Yankee Thermal Imaging is a full service energy auditing and insulation construction firm specializing in your residential and commercial energy savings needs. Established in 2008, we are a New Hampshire established business based out of Rochester and servicing the entire New England area.
Specialties: *Commercial & Institutional, Energy Auditing, Insulation, Multifamily, Single Family*

Yardi/Enerliance
370 Lexington Ave., Ste. 2100
New York, New York 10017
858-737-2726
mary.chu@yardi.com
http://www.enerliance.com
Now in its fourth decade, Yardi is committed to the design, development and support of software for real estate investment management and property management.
Enerliance produces the Load Based Optimization System (LOBOS), an intelligent HVAC platform that significantly reduces energy consumption in large buildings and campuses. LOBOS also enables automated demand response participation and system-level fault detection and diagnostics.
Specialties: *Commercial & Institutional, Energy Conservation, Information Technology*

Yaro Windows + Doors
84 Sherman St., Ste. 2
Cambridge, Massachusetts 02140
617-671-8905
mc@yaro-dsi.com
http://www.yaro-dsi.com
We collaborate with our clients to create added value.
We provide every client with comprehensive support from initial design concepts through finish installation. Our approach focuses on finding the best possible value by supplying custom designed solutions with supporting services of delivery and installation.
We are more than a building envelope supplier. Our commitment is to the success of our client's projects.
We carry out our work with extreme integrity and ingenuity, offering solutions that add value to your project.
Specialties: *Windows*

Yestermorrow Design/Build School
7865 Main St.
Waitsfield, Vermont 05673
888-496-5541
info@yestermorrow.org
http://www.yestermorrow.org
Yestermorrow Design/Build School is leading a sustainable design revolution, driven by three core beliefs:
1. Mastercrafters - those who integrate the designing and building process, create better, more holistic and human-centered environments.
2. The design of the built environment should be accessible to everyone - from DIY'ers to local change makers to the professional trades.
3. Sustainable design is also beautiful design. People will always care for and preserve places they love - even more so when they're built using sustainability principles.
We offer over 100 hands-on courses per year in design, construction, woodworking, and architectural craft. Courses include weekend to two-week courses, certificates, and semester programs concentrating in sustainable design.
Specialties: *Alternative Energy, Architecture, Beyond Energy, Building Design & Construction, Certifications & Standards, Cities & Communities, Construction Process, Design Process, Education, Envelope & Enclosure, Indoor Air Quality, Insulation, Landscape Design, Lighting Design, Mechanical Systems & Lighting, Money & Business, Net Zero Energy, Passive Housing, Photovoltaics, Remodeling/DER, Renewables & The Grid, Research, Solar Thermal, The Big Picture, Wind, Windows, Electrical*

Z

Zehnder America, Inc.
6 Merrill Industrial Dr., Unit 7
Hampton, New Hampshire 03842
603-601-8544
info@zehnderamerica.com
http://www.zehnderamerica.com
Zehnder America Inc. provides high quality heating and ventilation solutions to promote comfortable, healthy, and energy-efficient indoor living. Zehnder America is a division of the Zehnder Group, headquartered in Switzerland. The Zehnder Group is represented worldwide and specializes in advanced heating, cooling, and ventilation technology.
Specialties: *HVAC*

ZeroEnergy Design
156 Milk St., Ste. 3
Boston, Massachusetts 02109
617-933-9258
info@zeroenergy.com
http://zeroenergy.com
Green Architecture, Mechanical Design & Energy Consulting.
- *Modern houses, green homes, multi-family, and institutional architecture.*
- *HVAC Design & Energy Consulting for high performance homes and buildings. Passive House Consultants & Registered Architect on staff. Working in MA, ME, NH, VT, RI, CT, NJ, and more.*

Specialties: *Architecture, HVAC, Mechanical Systems & Lighting, Net Zero Energy, Passive Housing.*

INDEX TO ADVERTISERS

INDEX TO ADVERTISERS

ZIPsystem™ R-SHEATHING

Where Code Meets Comfort

- Enhanced Thermal Resistance
- Structural Durability
- Superior Moisture Protection
- Superior Air Protection

Structure, insulation and weather protection—all in one! ZIP System® R-sheathing and tape provides a new all-in-one approach to sealing, protecting and insulating your building envelope. Get the benefits of a structural panel, weather-resistive barrier, air barrier and nailable wood base on the outside combined with foam insulation already attached. ZIP System® R-sheathing helps achieve the added R-Value and strict energy demands from new codes and advanced building programs—all in one easy to install system.

ZIPSystem.com/R-Sheathing/buildingenergy23

FROM THE CREATORS OF AdvanTech

SOME OF THE MOST INNOVATIVE BUILDINGS ARE MADE OF GLASS AND STEEL. OTHERS, PIXELS.

Con Edison is proud to be a sponsor of NESEA's BuildingEnergy NYC 2016 Conference. Please stop by Booth #1 and attend our panel discussions to learn more about how you can save energy and money for your commercial and multifamily properties. Check out our new 3D interactive Commercial Buildings website, ManageEnergy.conEd.com. It's a one-of-a-kind interactive journey, and it's ready. Are you? #ManageEnergy

conEdison

EVERYTHING MATTERS